The Penalty of Over-Production is Financial Loss

IN THE April issue of this journal, we printed in this same column an editorial under the above caption.

We are using the same caption for our message for December.

We have come to the end of the year—there is less than thirty days remaining of the year 1927.

Some of the major divisions of the Paper Industry, however, are facing a shut-down. Their business is finished for the year, and they are looking into 1928 with no prospect for any immediate relief from the conditions that have produced the stagnation in the Paper Industry, only too apparent at this writing.

What is the condition that has brought about this stagnant and unprofitable situation in the newsprint, kraft paper and allied divisions of production?

Over-production.

The newsprint industry will close the year running barely eighty per cent of capacity. Additional machines are coming in and new mills are being built to add to the burdensome **Over-production.**

The kraft paper industry is flat on its back taking the count. The business for the year was finished in November with no mills in this division of the industry having business enough to run a week. A general shut-down of the kraft mills is the only logical result. Here again, **Over-production** is the cause.

The capacity of the mills now producing kraft is in the neighborhood of 2,100 tons per day. In addition, two new mills in the course of construction now will come into operation after the first quarter of 1928 with an additional daily capacity of 250 tons per day. In addition, there are large stocks of kraft paper in the hands of the producing mills and to accentuate the situation, a horizontal decline of $10.00 per ton was put into effect in November.

Using the kraft paper situation as an illustration of the deadly effects of **Over-production,** let us point out that on the basis of 2,000 tons per day of production, a cut of $10.00 per ton on the kraft paper prices means a loss to the producers alone of six million dollars per year.

Now, **Over-production** was responsible for the cut. More kraft paper is being made than the users of paper can consume, but in spite of it, the owners of timber, the promoters of mills and the investors of money continue to put more investment into the production units in the face of a declining market and a pronounced **Over-production** situation. A cut of $10.00 per ton did not stop the **Over-production** nor did it stimulate the consumption. To all observers, it has had exactly the reverse effect, for the building of mills and the addition of machines for making kraft paper are

EDITORIAL

going merrily on; the cut in price has only served to make the buyers and consumers of paper withdraw farther from the market. The situation resembles closely an incident recently told us:

A woman called her husband at his business office and said: "John! the water is pouring into our house and we can't shut it off. We will soon be flooded. Telephone the Water Works and have them do something about it right away." John grabbed the phone and called the Water Works' office and told them the substance of his wife's complaint, but instead of shutting off the water, they informed him that they would give him a lower price for water.

Query: How did the cut in the water rate remedy the flooded condition of the man's house?

Surely, the penalty of **Over-production** is financial loss—financial loss not only to the producing companies and investors in it, but as it must result in a shut-down of all the mills in that division, a curtailment of activity throughout the entire industry, loss of time, loss of wages and loss of earnings.

THE PAPER INDUSTRY in all seriousness submits this query to its readers and especially directs it to the producers of paper: Would it not be better policy to take some of the money represented by the cut in the prices and invest it in some form of investigation and relief of the evils of **Over-production** in the Paper Industry? For

The Penalty of Over-production is Financial Loss. Stop **Over-production** and financial loss will stop.

Making Alum in the Beater

SOMETHING altogether new and novel in the sizing and loading of paper stock in the beater is effected by a process on which a patent has been taken out by two gentlemen connected with the Kimberly-Clark Company to whom it has been assigned.

Taking about equal parts of china clay and sulphuric acid, water is added in the proportion of nearly one-third of the combined weight of clay and acid. The mixture is then stirred and heated by steam until the reaction is completed, which ordinarily takes an hour and thirty minutes. China clay in its pure form is practically pure hydrated aluminum silicate, and when the theoretical quantity of acid is incorporated with it to bring about a chemical reaction, basic aluminum sulphate is precipitated, in addition to a considerable proportion of silica in an extremely fine pulverized condition. A slight amount of dehydrated aluminum silicate may also be precipitated, but in a negligible quantity.

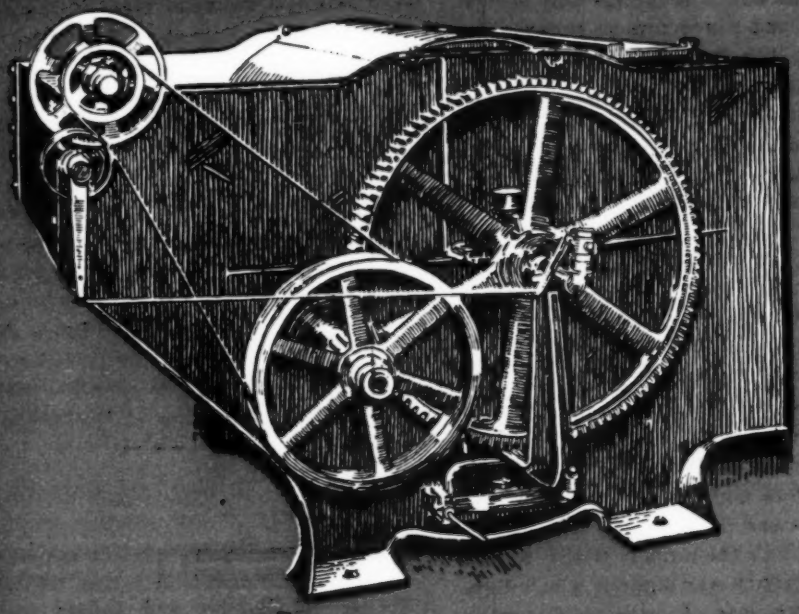
It will be seen that we have here a mixture containing basic alum in solution, which may be added directly to the paper stuff or stock in the beater to fix any rosin size that may have been previously incorporated with the stock, while the silica, aluminum silicate and any other ingredients resulting from the original composition of the china clay will be taken up by the fibers and constitute a good loading or filling material for the paper.

An Obsession of Industry

THAT the paper industry has set itself to face resolutely the question of resolving the problem of over-production and its consequent evils is evident from the character of the subjects discussed when two or more men meet in conference to consider trade tendencies. There is now more of a disposition to study the effects of over-production and remedies for it than at any time in the previous history of association work.

In a recent issue of the Weekly Business Review of the American Paper and Pulp Association, there is a suggestive article on production operations and profits in which the subject of over-production, which has been treated editorially on so many occasions in the columns of THE PAPER INDUSTRY, is again pilloried as the enemy of profits. The association bulletin asks if the industry is going volume-mad for the sake of pointing to increased production operations, without thought of consequent shrinking profits.

No business can operate profitably without considering established costs and selling value and there is a loss point and an earning point below which or above which plant operations either become failure or success. It would appear to be the case that too many concerns are establishing their loss point at or near capacity, on a flexible scale reactive to their sales departments. In these cases, as is pointed out in the article referred to, the actual per cent of plant operation becomes the loss point. Careful and efficient management should be able to initiate studies to determine the loss point and lay plans accordingly.



A Save-All that saves money

The Bird Save-All recovers a high percentage of the solids from the white water and puts the fibre and the water in shape for immediate re-use.

It does this at such low cost that the fibre recovered represents as nearly as possible a clear profit.

Isn't that what you want in a Save-All?

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E D I T O R I A L

The idea that a plant to prove profitable must operate at or near capacity is an obsession which has grown to dangerous proportions in nearly all lines of American industry during recent years. We are regaled with records galore of increased output per man and swelling totals of production which should ordinarily point to increased earnings, but that such is not the case is evident when we get reports in many quarters of shrinking profits or even losses.

Before the Altar of Price-?

IT was during Roosevelt's administration that the great American public was finally successful in communicating to the American retailer the fact that they were severally divided with regard to their buying habits and desires. By irrefutable performance they indicated that while a few thousands were willing to pay $18 for a hat, hundreds of thousands wanted to pay $9 for their hats and **limitless millions** made up the market for good hats at $4 each.

Manufacturers in general accepted the verdict and automatically classified themselves and their product with the consuming public by the price tags affixed to their merchandise.

What happened to hats also affected shoes, automobiles, neckties, lawn-mowers, goldfish and fence. No commodity remained unaffected by the change in market conditions with the result that we have batteries ranging in price from $7.50 to $28; $1.50 to $8 fountain pens; $10 to $800 phonographs, and goblets sold by both Woolworth and Wanamaker.

Under this changed condition, the manufacturer was compelled to set up certain standards of value **per dollar of cost.** Competition became the leveler of prices and the correcting medium for inequality. If the value of one product is noticeably less than that of a competitive product in the same price range, the public quickly decides which product shall be consumed and which manufacturer shall increase or lower the price.

To superficial thinkers whether in public, retailing, jobbing or manufacturing endeavor, this change in market conditions might appear to be setting up of a price altar before which everyone must salaam. On the contrary, our existing market condition is just as it should be. In spite of current and oft-discussed beliefs, we are not worshippers of price. At no time has the public ever demanded a $20 value for a $10 price. No one has ever asked Ford to put a twin-six motor in his $600 car and none has ever asked for an 8-tube heterodyne for the price of a crystal set.

The American public does not now, and never has worshipped before the shrine of price, and the dealer or jobber who thinks it does, or the manufacturer who gives unduly large discounts or shades his price, under the fallacious belief that price is all important, is merely cutting his own profits and contributing to the demoralization of industry.

This is not to say that discounts or special quantity prices do not provide incentive for increased sales. Perhaps a manufacturer, through some act of good business judgment, such as the installation of new and better manufacturing equipment, extremely favorable purchases of large quantities of raw material or minimized sales expense has effected a considerable reduction in costs. Under such a condition, it is only natural that he should keep his established prices and pass along some of the benefit of his good judgment in the form of economically sound discounts. But not otherwise.

The American public kneels before the altar of quality—**not** before the shrine of price. Quality consistent with cost, is sought by every one of our hundred million American buyers and the sooner trade in general assimilates that fact and conforms its business to it, the better will be all industry.

The sole means to the end of better profits is quality—quality products and quality merchandising. The manufacturer who, regardless of product, can keep one step ahead of the cycle of public preference and demand and uphold a high standard of quality—that is the manufacturing business that will grow, and his is the product that will establish the standard of value for the public. Likewise the distributor, dealer or consumer who looks beyond discounts to quality in both product and policies is the one who will gain constantly increasing value, per dollar invested.—William Sibley.

THE PAPER INDUSTRY

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Vol. 9 DECEMBER, 1927 No. 9

Accounting For Labor in the Plant

By J. J. BERLINER
Accountant and Auditor

THE accounting for labor in the plant has four main objectives:

1—To ascertain the amount of wages due each worker so that pay-rolls can be prepared.

2—To show the labor costs by units—whether they be jobs, contracts, classes of products, or departments, processes, etc., so that proper direct-labor costs can be entered on cost sheets.

3—To provide data for figuring burden or overhead expense. (Indirect labor or labor not used in direct production of the goods such as foremen, clerical help, etc.)

4—To provide data through the foregoing procedure so that proper control of labor may be maintained.

It will be useful to enumerate here the chief forms used in order to reach these objectives, together with a brief explanatory comment of their functions. These forms are:

1—Weekly In-and-out Card. A clock card (Form 1) is assigned to each worker in order that he may record thereon the time when he arrives in the plant and leaves it—in other words, the in-and-out time. The function of this card is the same in every plant, although its form may vary slightly.

2—Time Card. Time cards (Forms 2 and 3) vary according to the kind of labor information desired and the system of wage payment in use in the plant—regular day-work, piece-work, or premium or bonus. As a matter of fact, the accounting for labor on time cards and other labor records probably depends more upon the system of wage payment than upon any other factor.

3—Late and Absent and Overtime Reports. If a worker is present during the full working day, his in-and-out card and time cards will show this fact. If he is late or absent, or if he works overtime, this fact is entered on a late and absent, or an overtime report (Form 5 or 6) as the case may be.

4—Pay-Roll Sheets. The pay-roll sheet (Form 7) assembles the pay of each man from the time cards representing the detail of work performed, and supplies the basis for the journal entry for the distribution of pay-rolls.

5—Labor Transfer Record. The labor transfer record of workers temporarily loaned by one department to another.

Weekly In-and-Out Clock Cards

The weekly in-and-out clock card shows the time the worker enters and leaves the plant each day. The difference between the two figures for each day is the time when he is supposed to be in the plant. This figure is checked up with the time reported on the time cards. Inasmuch as the time cards show the time worked as well as the cost of labor performed by each worker, it can be ascertained whether or not he was idle during any of the time he was in the plant. Still another use is made of in-and-out cards, namely, to aid the pay-rolls department in locating differences in the pay-roll.

Duties of the Time Clerk

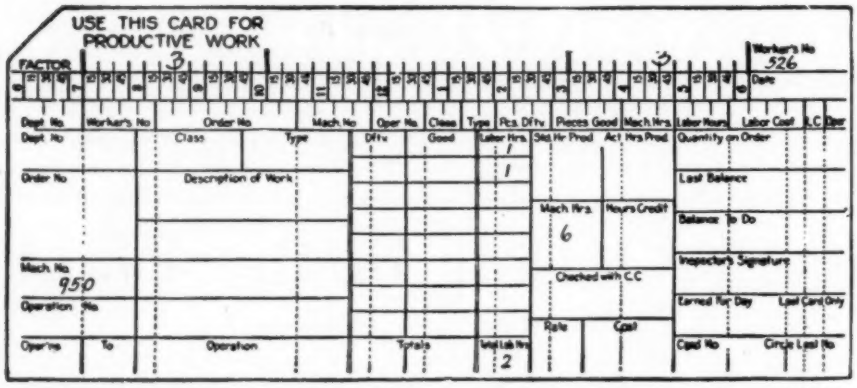
The time clerk sees that the workers stamp in-and-out cards properly. Each week the time clerk forwards the in-and-out cards, after they have been properly stamped, to the pay-roll department to be filed consecutively by workers' numbers. The in-and-out cards do not show the actual time and cost of work done, nor do they show the workers' idle time. The detailed accounting for labor does not really begin until the time cards are filled out. This work should be done by the time clerk. If workers are permitted to fill out time cards, they may lose the cards or get them so dirty that they are illegible.

Before taking up in detail the preparation of time cards, the various duties of the time clerk, in so far as his duties in connection with time keeping are concerned, may be outlined as follows:

1—To account for all working hours of employees in their departments.

2—To enter on time cards the time when operations are commenced by workers.

3—To place the card in a rack under the proper working place number.



Form 2 (b)—Direct Labor Time Card Filled in to Indicate Use of Factors. (Size, 7⅛x3¼.)

4—To remove the card from the rack when the job is finished.

5—To enter the quitting time.

6—To calculate on the cards the elapsed time.

7—To turn in for each worker enough cards to represent the entire time he was present. These time cards are checked up with the late and absent, and overtime reports for the purpose of noting any deviation from the standard number of working hours.

8—To stamp night and overtime on cards for night work and overtime.

9—To enter the quantity of work accomplished as called for in each case.

10—To enter all idle machine time on idle machine cards as specified.

Time Cards

There are two principal kinds of time cards—one for direct or productive work (Form 2a) and another for indirect work (Form 4).

The same form of direct-labor card is used for all direct, productive work whether it be done under the regular day-work, piece-work, or premium or bonus system of wage payment—the regular day-work card being different from the piece-work, bonus or premium card in color only. A recapitulation card, called the bonus and premium report, is used in conjunction with the direct-labor card under the premium or bonus system.

The day-work system is not as common as formerly, owing to the adoption of piece, premium, bonus, and other special methods of wage payment.

The following is a detailed description of the data on the time cards for direct work (see Form 2a). The circled figures appearing upon the card have been inserted merely for the purpose of identifying the columns referred to in the following discussion.

1—Worker's Number. The worker's time-clock card number.

2—Date. Stamped with date stamp.

3—Department Number. The number of the department on whose payroll the worker belongs.

4—Order Number. This is secured from the production order.

5—Machine Number. The number of the machine which the employee is operating.

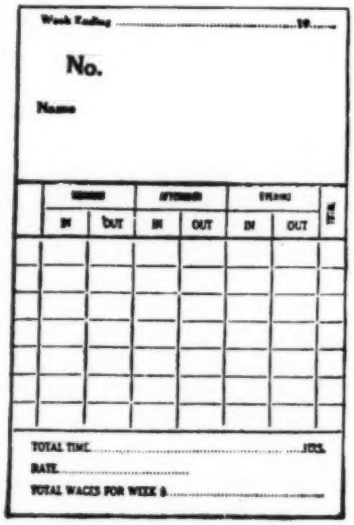
6—Operation Number. The identifying number of the operation being performed.

7—Operations. The total number of operations which are to be performed on the material.

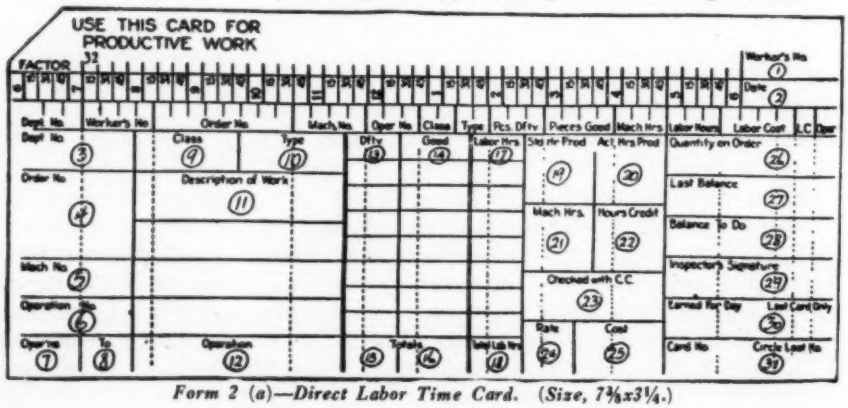
8—To. The next operation to be performed.

9—Class. Class of goods being made.

10—Type. Type of goods being made.



Form 1—Weekly In-and-Out Card. (Size, 3¼x5½.)



Form 2 (a)—Direct Labor Time Card. (Size, 7⅛x3¼.)

11—Description of work.

12—Operation. Name of operation being performed by the worker.

13—Defective. Spoilage during operation.

14—Good. Number finished during operation.

15—Totals. Sum of (13).

16—Totals. Sum of (14).

17—Labor hours.

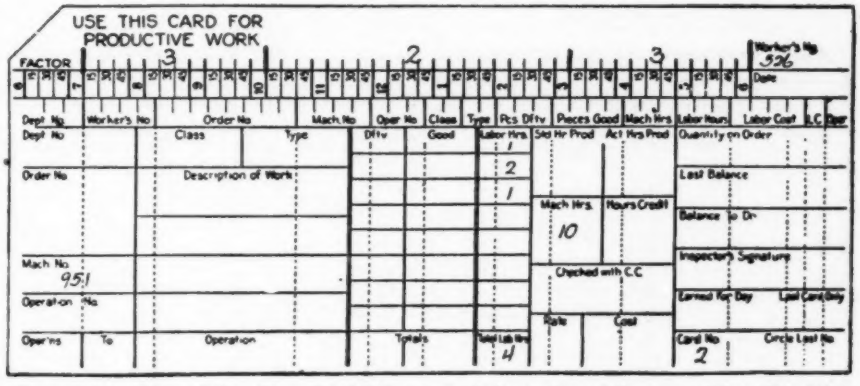
18—Total labor hours.

19—Standard Hourly Production. The standard rate per hour accomplished.

20—Actual Hourly Production. The actual rate per hour accomplished.

21—Machine hours. Total number of machine hours.

22—Hours of Credit. Number of finished divided by standard hourly rate of production.



Form 2 (c)—Direct Labor Time Card Filled in to Indicate Use of Factors. (Size, 7⅜x3¼.)

23—Checked with clock card. A distinguishable check mark or the initials of the time clerk who checks the labor card with the in-and-out card is entered in this space.

24—Rate. The rate of pay.

25—Cost. The labor cost which is the rate, piece or day (24), multiplied by the total number of good pieces made (16) if piece work, or the number of hours, (18) if day work.

26—Quantity on order. The total quantity of the particular product ordered.

27—Last Balance. The balance of order left after previous quantities made have been subtracted from the quantity on order.

28—Balance To Do. The quantity of the order which is still unfinished and is obtained by subtracting the total good (14) and defective (15) pieces from the last balance (27).

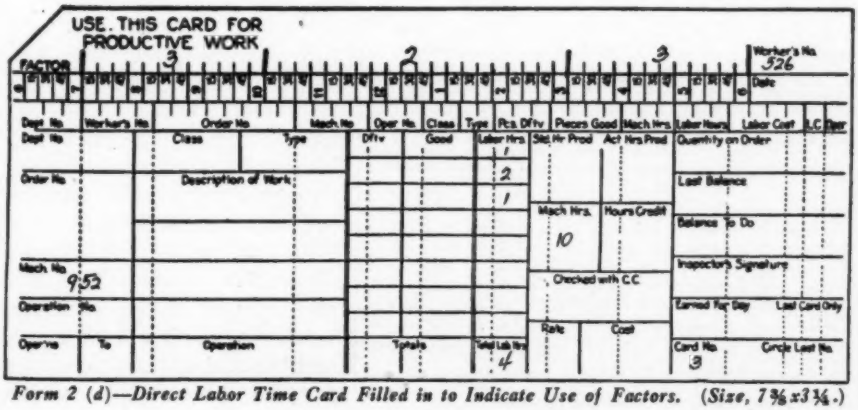
29—Inspector's Signature.

30—Earned for Day. Total earnings for day is extended on last card for day only.

31—Card Number. Each worker's cards are numbered consecutively using 1 for the first card in the morning, 2 for the second card, etc. A circle is placed around the last card number. Cards are numbered consecutively for workers who have more than one card for a day's work, in order to insure the receipt of cards for the entire day.

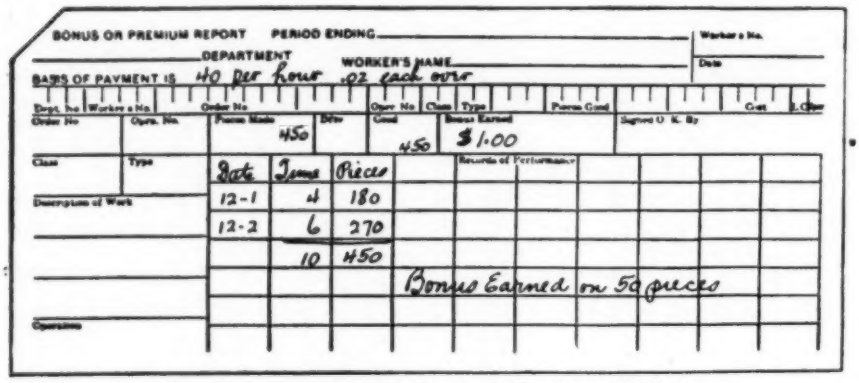
32—Factor. The use of all time cards except the bonus card involves a somewhat special feature known as the calculation of factors. The factor is the term given to the number of machines a worker operates. It is shown on the horizontal scale across the top of the card.

By reference to the three cards (Form 2 b, c, and d), the method of calculating factors can be understood. Employee No. 526 started work at 7 A. M. on three machines, each of which is represented by one of the cards. At 10 A. M., machine No. 950 stops because of a breakdown. The hours that machines are idle are reported on idle machine cards. The worker continues to operate the other two machines, Nos. 951 and 952. From 7 A. M. to 10 A. M., therefore, worker No. 526 has operated three machines. Hence, his factor for that period is 3, that is, the same as the number of machines he was running. The factor is indicated on the three cards by drawing heavy vertical lines at 7 A. M. and 10 A. M. respectively, and writing the figure 3 between the lines. The difference in the time is shown by the number of hours between the vertical lines is 3. This figure is divided by the factor for that period, which is also 3, and the result is the labor hours (1) to be entered in space (17 labor hours) on each card. While worker No. 526 continues to operate two machines, his factor is 2. . He resumes operation on machine No.



Form 2 (d)—Direct Labor Time Card Filled in to Indicate Use of Factors. (Size, 7⅜x3¼.)

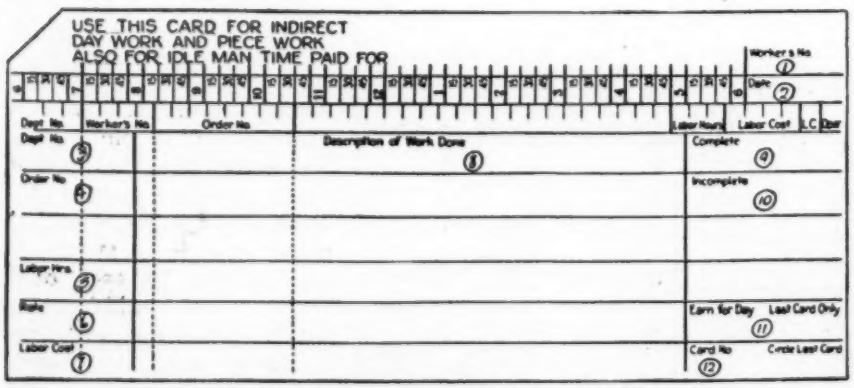
950 on the same production order at 3 o'clock and consequently his factor again becomes 3. Heavy vertical lines are drawn at 3 o'clock on all of the cards. On the cards shown in Forms (2 c and d), 2 (the factor) is written between the 10 o'clock and 3 o'clock lines. The period represented by the difference in hours between the lines is 4, as one hour is taken off for lunch. This is divided by the factor 2 and the result (1) is the number of labor hours to be entered in column (17) on the second line on Forms (2 c and d).



Form 3—Bonus or Premium Report Card. (Size, 7⅛x3¼.)

Bonus or Premium Report Card

The method of accounting for labor under the bonus or premium method of wage payment involves the use of regular time cards and the bonus or premium report card. (Form 3) which is a recapitulation card of the bonus or premium earned by the worker. These cards are made out in duplicate. The original bonus report or premium card is given to the worker so that he himself can check up on the calculations of bonuses and premiums made by the office, and the duplicate is forwarded with the product to the inspector and later to the payroll debonus or premium repors do not obviate the needs of partment. It should be clearly kept in mind that the regular time cards.



Form 4—Indirect Labor Time Card. (Size, 7⅛x3¼.)

Time Cards for Indirect Work

Another important feature of accounting occurs in connection with indirect work. It will be remembered that time cards for direct work are chargeable to production orders. Time cards for indirect work (Form 4) are chargeable to standing orders.

Cards for indirect work are filled out as follows:

1—Worker's Number. The worker's time clock number.

2—Date. Stamped with date stamp.

3—Department Number.

4—Labor Hours. The time spent on the work.

5—Rate. The worker's rate per hour.

6—Labor Cost. The time spent, times the rate per hour.

7—Description of Work Done. The description should be complete; e. a., Repairing Machine 12.

8—Complete. A check mark is placed here if work is complete.

9—Incomplete. Checked here if work is incomplete.

10—Earnings for day. Extension of total earnings for day to be on last card for day only.

11—Card Number. Worker's cards are numbered consecutively.

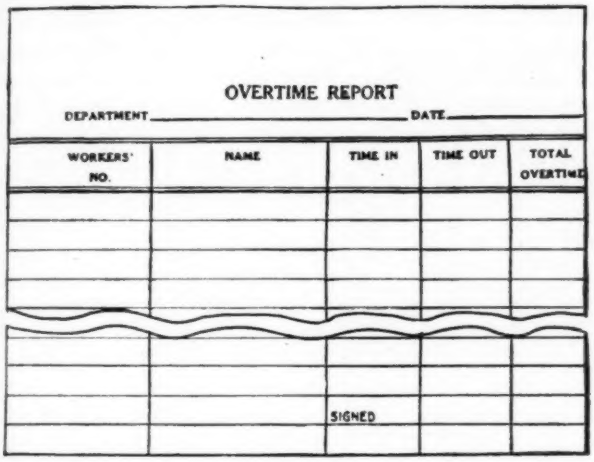
Checking Labor Cards

The second principal step in accounting for labor consists of checking the labor cards. The time cards for each day are checked the following morning. The time clerk must see that the time cards for all workers in each department are checked. In order to do this properly, he must be provided with a list of the numbers of the workers in each department and must prepare overtime reports (Form 5) and late and absent reports (Form 6). For exceptions to the regular hours of employment the procedure is as follows:

Shortly after the starting time in the morning and after the lunch hour, the time clerk takes the cards left in the "out" rack and keeps in his time booth. Any worker who is late reports to the time booth for his time card and the time clerk fills out on the late and absent report of the worker's number and name, and the rest of the data called for on the report, which

is self explanatory. Absent time is recorded in the same general way from the cards of absent workers and during the day for all workers who leave the plant before the regular quitting time.

From the passes issued for overtime, the time



Form 5—Overtime Report. (*Size, 5x7¾.*)

clerk prepares the overtime reports, which are self explanatory.

For all workers who are present for the full day's work, the time on the time cards must total the regular hours—8, 9, or 10, as the case may be. After time cards are checked by the time clerk for full labor hours as well as for full machine hours, they are placed in numerical sequence and are then forwarded to the pay-roll office.

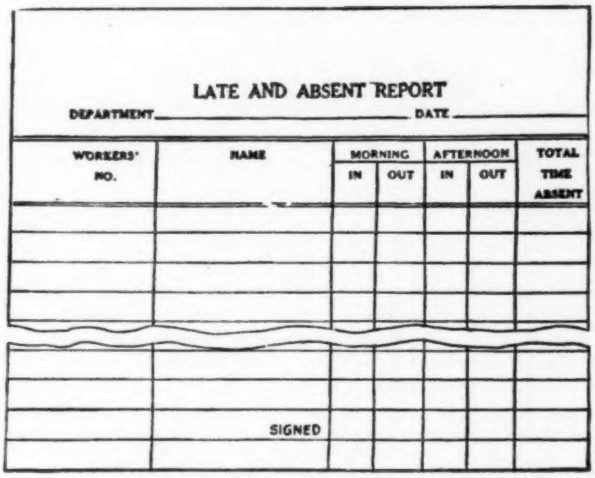
Accounting for Labor on Pay-Rolls

The third principal step in accounting for labor is the summarization of labor costs.

Before the pay-roll sheet is taken up, it might be well to insert a word about the condition of the time cards when they reach the pay-roll department. By turning over these cards in orderly and proper shape, the time clerk can help the pay-roll department greatly.

It is very important, for instance, that the time cards be delivered to the pay-roll department with all cards representing the day's work of each man. The cards for each man should also be in their numerical sequence, it being remembered that when a man uses more than one card per day the various cards representing his day's work are serially numbered.

It is natural that the cards should be in order, as the last move made by the despatch clerk or time clerk should be to verify the fact that a man's entire time is represented by the time cards, after they have been checked with the late and absent reports and the overtime reports.



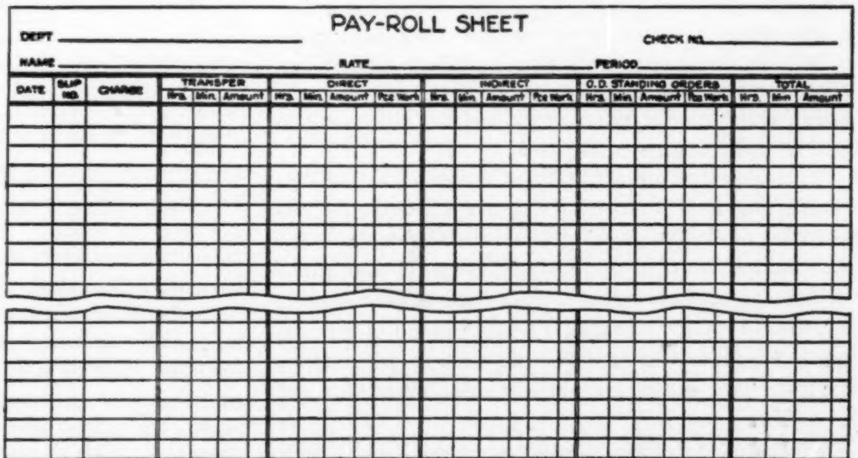
Form 6—Late and Absent Report. (*Size, 5x7¾.*)

The cards should also be in sequence according to the worker's check number, as this is the condition in which they should be handled in the time booth of the plant.

Arrangement of Pay-Roll Sheets

The pay-roll sheets (Form 7) should be in binders and should be made ready for the entries of a pay period before the entry of the pay-roll is started. This means that the full data at the top of each pay-roll sheet should be filled in, including the department name, the name of the worker, his day rate, his check number, and the pay-roll period.

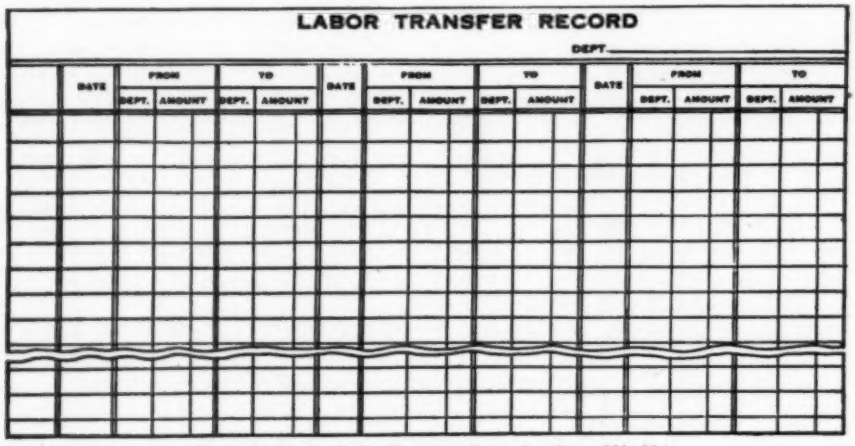
If the sheets are prepared ahead of time from the list of check numbers last known to be employed in



Form 7—Pay-Roll Sheet. (*Size, 13x8½.*)

the department, a great deal of time will be saved in the current work of entry.

In some places it has been found of advantage to have the pay-roll sheets loose during the posting period, as the sheets will then be perfectly flat for entry. If this method is used, however, great care must be taken to see that none of the sheets become separated from the file.


LABOR TRANSFER RECORD

DEPT.

	DATE	FROM		TO		DATE	FROM		TO		DATE	FROM		TO	
		DEPT.	AMOUNT	DEPT.	AMOUNT		DEPT.	AMOUNT	DEPT.	AMOUNT		DEPT.	AMOUNT	DEPT.	AMOUNT

Form 9—O. D. S. O. Transfer Record. (Size, 8½x11.)

Details Shown on Pay-Roll Sheet

The first column on the pay-roll sheet is the date column, in which it is necessary to enter the day of the month, as the period date at the top gives the other information desired.

The column headed "Slip Number" is for the purpose of entering the serial number of the slips for the worker when more than one time card is required to represent his work. In this connection, it is to be remembered, that the serial number on the last card representing the day's work should be enclosed in a circle. This automatically shows the pay-roll clerk that all the cards for each worker are in hand. The column headed "charge," is for the entry of the order number covering the work accounted for by the time card. This may be either a standing order number or production order number. The nature of this order number regulates the entry of the time in the columns which follow.

There are five main blocks of columns across the sheet. The first four of these are of extreme importance, as they become the basis of the controls for each subsequent movement of labor through the medium of journal entries. Each has a very specific use, and too strict attention cannot be paid to mastering and understanding fully the uses to which they are put. The blocks are herewith described in regular order:

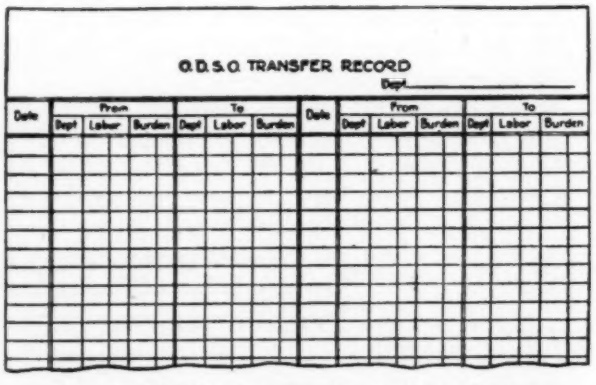
1—Transfer. When one department loans a man for some hours or days to another department, the time of loaning is usually not sufficient to warrant changing his check number, and therefore this method is used to obviate the mix-ups which might otherwise arise.

When the pay-roll clerk of the department recording the pay of a man who has been loaned to another department finds a card stamped "Transferred to Department A," he should enter this card under the transfer heading. This entry has the effect of registering the man's time for pay on his own pay-roll, and at the same time providing the entry in a column ready for use in connection with the labor transfer record.

2—Direct. A card whereon the order number shown is that of a productive order of the home department, should be entered in this block. It will be noted that there are two main columns shown in this block, as well as the two succeeding blocks, one headed "Amount" and the other headed "Piecework."

The object of this distinction is to separate day and piece work in order that the pay-rolls may automatically show how much of the direct labor is operating under day work as against any special inducement method other than day work.

It might be noted here that the straight-time earnings under bonus work or any other kind of premium work should be also entered in the piece-


O.D.S.O. TRANSFER RECORD

Dept.

Date	From			To			Date	From			To		
	Dept	Labor	Burden	Dept	Labor	Burden		Dept	Labor	Burden	Dept	Labor	Burden

Form 9—O. D. S. O. Transfer Record. (Size, 8½x11.)

work column, this heading being used for any kind of work other than straight day work.

3—Indirect. The indirect block is arranged exactly as the direct block. Entries to be made therein are confined to work performed by anyone in the department on any standing order number of the department. In other words, no work must be included which is done by the department on the standing order number of any other department or any general department. The entries must be confined wholly

to work on the standing orders of the department of which the worker whose pay-roll sheet is being prepared is a member.

4—O. D. Standing Orders. "O. D. Standing Orders," and is designed to cover the entry of any work performed by the department of which this employee is a member on the standing order of any other department in the plant.

The work entered in the O. D. S. O. columns is of the same nature as that entered in the direct column, so far as the originating department is concerned, and must be considered in conjunction with the direct in finding the basic figure for the burden rate.

5—Total. The entries in the Total column consists simply of the total time and amounts, and show the total earnings for each day, as well as the total time for each day. In this connection, it might be brought out that even though the time cards are supposed to have been verified by the time clerk as to the total elapsed time for each day, the clock cards are brought to the pay-roll department at the close of the week for a final check against the time as shown daily on each man's pay-roll sheet, to doubly safeguard the accuracy of the pay records.

Closing the Pay-Rolls

As each day of each man's time has been entered, the total time and amount has been brought out to the total column. At the close of the pay period, the entire sheet is footed vertically in all its columns, and cross-footed to agree with the vertical footing of the total column. This makes an absolute check on the accuracy of the time and money entries and is a valuable feature in connection with the technique of pay-roll accounting.

If bonus or premium systems are in effect, it is then in order to enter at the bottom of the pay-roll sheet the bonus or premium which is due each man, in case there is no special bonus or premium pay-roll sheet provided therefor. Deductions from the pay-roll which may be necessary, should then be entered. After these additions and deductions have been made, the net amount of pay for the man can be computed, and the pay envelope made out accordingly.

Splitting Pay-Rolls at Close of Month

Many times when the pay-roll period is one week, the end of the month comes in the middle of a week. In such cases, it is necessary to enter the cards of the last working day of the month and to rule footing lines after the entries of this day. The entries for the remaining days of the week are then made, and after all the entries are in for the last day of the week, another subfooting line is ruled in. It is then necessary first to add the sheets down to the first subfooting, and then the balance of the days of the week down to the second subfooting—each section separately. The two subfootings must then be added to arrive at the total for the week.

Graphic Outline of Various Methods of Payment of Wages in use

	How to Pay for Work		
Average the Output and approximate the Pay to it.	Straight Sales or Hourly Wage	Classify workers. Keep time. Supervise quality and quantity. Adjust wages to worth.	Traditional method. Value depends on judgment and frequent revision.
	Standardized day work	Set standard operation costs, or make machine set pace. Grade wage rate (monthly by workmen's records).	Where work is routine, has proved effective and less cumbersome than bonus or piecework.
	Additional Bonus or Commission	Examine worker's records at intervals and add a lump sum to current pay.	Especially useful among better educated classes of employees.
	Share the Profits	In proportion to each man's wages—according to individual record—in an arbitrary amount for each grade of workmen. Payment in cash, stock or both.	Requires a long period for test of its effect on efficiency but successfully applied to many types of business.
Fit the Pay accurately to the Output.	Gantt Plan	Standardize time and teach best method. Set a task and pay hourly wage as a minimum. Add 25-100% bonus for standard time and quality.	Suits varied tasks. A simple intermediate between day work and scientific piecework.
	Straight Piece Rate	Standardize conditions and set rates accurately. Guarantee day rate as a minimum. Correct and inspect output. Avoid rate changes.	In theory, perhaps the fairest way to pay adapted to "Report" operations. Simple to operate.
	Premium Plans (Rowan L. Halseha)	Correct conditions and set established standard pay day wage. Pay workers extra for time saved.	Easy intermediate step from day work to piecework.
	Taylor Differential Piece Rate	Standardize tools and motions. Teach workers. Set a minimum piece rate that will net regular day wage. Pay a rate (up to 40%) higher per perfect piece where output is up to schedule.	Sharply stimulative; especially fits where labor cost is low, and machine or overhead cost is high. Complicates payroll and cost calculations.
	Emerson Premium Plan	Standardize and teach work as in Taylor system. Set minimum hourly rate of pay. Lay out grades of efficiency and add a per cent to rate of men who grade 66⅔%. Increase up to 20% bonus at 100% and more above.	Theory nicely planned to encourage worker. In practice, often not understood or appreciated by workers. Complicates payroll and cost calculations.

Pay-Roll Totals

The next operation is to arrive at the total of the pay-roll for each department. The procedure consists merely of adding the total time and amount of money for each block, whereby is shown the total for transfer, direct labor, indirect labor, O. D. standing orders, as well as the total pay-roll. Note that the totals are to be in both time and money.

This total must be arrived at for each individual pay period, but in addition to this a monthly total will be made by recapitulation as follows:

The last subtotal of a split pay-roll at the beginning of the month starts the recapitulation for the month. The full, pay-rolls during the course of the month are then taken, and to them is added the first part of the split pay-roll at the end of the month. This gives the exact total of the pay-roll during the current month, which then becomes the basis of the journal entries to effect the controls.

In this connection, it should be stated that the total of the full week's pay-roll is the amount for which the pay-roll check is drawn and which credits cash and charges the pay-roll account. It will be seen by this that the credits which are made to the pay-roll accounts because of transfers to the various control accounts are in advance of the payment of the last pay-roll, which in turn explains the reason for there being always in the balance sheet an accrued pay-roll in the liability section. Only the actual pay-roll of the month being figured is needed for control purposes.

After obtaining the totals for each department of the headings as shown on the pay-roll sheets for the entire month, the journal entry is prepared, crediting the actual pay-roll figures for the month to the pay-roll accounts, and charging the various control accounts involved.

The Moisture Equilibrium of Egg Case Fillers, Flats and Pads

By SIDNEY D. WELLS,
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THE moisture content of egg case packing material when it has come to equilibrium with the atmosphere surrounding it, is a point of considerable interest to the manufacturers of this material and the egg packers using it. Information on this subject is not readily accessible and for that reason series of tests were made during the winter of 1926 and 1927 to ascertain what was the moisture content of egg packing material under typical conditions of storage in unheated warehouses and also under cold storage conditions. The following types of material were studied:

1—Excelsior pads
2—Holed-tite cup flats
3—White spruce fillers
4—Lime cooked straw fillers
5—Lime cooked straw flats
6—Original Nu-Process fillers
7—Modified Nu-Process fillers
8—Modified Nu-Process flats

Note:

Holed-tite cup flats are molded products made on a special wet machine from over issue newspaper stock under the Mann and Mapes patents.

Original Nu-Process fillers are prepared from straw cooked with a mixture of sodium carbonate and sulphite as described in the paper by Messrs. Rue and Monsson which appeared in the Paper Trade Journal of October 8 and November 12, 1925. Patent application covering this process has been filed.

The Modified Nu-Process fillers were made from straw cooked with a mixture of sodium carbonate and elemental sulphur as described in United States patent 1,626,171 issued April 26, 1927.

Tests in Unheated Warehouses

The first series during the months of January and February, 1927 were made in an unheated warehouse. The object of these experiments was to ascertain the point of equilibrium in unheated warehouses typical of the surroundings in which the material would be stored to await the time when it would be needed for the packing of eggs. The condition of the material as it went into the warehouse varied from a moisture content of 5.8 per cent for some that just came off the paper machine, to 12.2 per cent for some that was received by freight sometime after it had been manufactured. Typical samples of various types of material were put in an unheated warehouse, and at the same time average samples were taken and dried to determine the moisture content. The material in the warehouse was taken out at intervals and weighed, and at the same time the temperature and humidity of the warehouse was determined. Table 1 gives the weights of the material as determined on the dates indicated, the temperature and relative humidity observed and the amount of moisture present in each type of material. About forty-eight days was required for the material to come to equilibrium and the time required for each type of material

seemed to be about the same. The relative humidity at the time the material came to equilibrium was 66 per cent which happened to be a fairly close average of the relative humidity throughout the period. The moisture content of the various types of material at equilibrium was as follows:

Lime cooked straw fillers 12.6 per cent
Lime cooked straw flats 13 per cent
White spruce fillers 13 per cent
Original Nu-Process fillers 11 per cent
Modified Nu-Process flats 11.1 per cent

The moisture content of excelsior pads when taken out of similar storage at another time was 15 per cent. The moisture content of cup flats taken out of similar storage was 12.3 per cent.

Tests in Cold Storage

The second series of tests was made under cold

UNHEATED WAREHOUSE—TABLE I

	Relative Humidity	Lime Cooked Fillers		Lime Cooked Fillers		Lime Cooked Flats		White Fillers		Original Nu-Process Fillers		Modified Nu-Process Fillers		Modified Nu-Process Fillers		Temperature
Date 1926	%	Grams	%	Grams	%	Grams	%	Grams	%	Grams	%	Grams	%	Grams	%	°F
12/30		1079	10.7	1077.5	10.1	505	10.4	1141	12.2	1122.5	5.9	1058.5	6.5	446	5.8	
12/31	35			1058	8.0			1104.5	8.8							65
—1927—																
1/3		1083.5	11.1	1079.5	10.3	507.5	11.0	1122	10.3	1157.5	9.0	1085.0	9.1	454.5	7.9	
1/5		1086.5	11.3	1081.5	10.5	508.5	11.2	1130.5	11.1	1161	9.4	1086.5	9.2	459	9.1	
1/7	55½	1085.5	11.2	1082	10.7	509.5	11.3	1133.5	11.6	1161.5	9.5	1087	9.3	461	9.3	46½
1/10	52	1086.5	11.3	1085	11.0	510.0	11.5	1135	11.7	1162.5	9.6	1088.5	9.5	461.5	9.7	42½
1/12	62½	1086.5	11.3	1085	11.0	511.0	11.7	1136.5	11.8	1162	9.5	1090	9.7	46	9.9	45½
1/13	67	1089	11.6	1088	11.2	513.0	12.2	1139.5	12.0	1163.5	9.7	1092.5	10.0	464	10.2	43
1/14	75	1089.5	11.7	1088.5	11.3	514.0	12.3	1141.0	12.3	1163.5	9.8	1092.5	10.0	465.5	10.8	39½
1/27	61	1095.5	12.3	1093.5	11.8	519.5	13.7	1148	12.8	1176	10.7	1100	10.7	469.5	11.6	35¼
1/29	68	1096.5	12.4	1094.5	11.9	520.0	13.8	1150	13.1	1177.5	11.0	1101.5	10.9	470	11.7	50½
2/17	66	1097.5	12.6	1095	12.0	516.5	13.0	1149.5	13.0	1177	10.9	1103.5	11.0	460	11.1	53
2/21		1038	6.3	1038.5	6.1	489.0	7.0	1078	6.0	1116	5.1	1045.5	5.1	444.5	5.7	
Oven Dry	0	975	0.0	979	0.0	457	0.0	1017	0.0	1061	0.0	994	0.0	421	0.0	212

COLD STORAGE—TABLE II

	Relative Humidity	Excelsior Pads		Cupped Flats		White Fillers		Lime Cooked Fillers		Lime Cooked Flats		Original Nu-Process Fillers		Modified Nu-Process Fillers		Modified Nu-Process Flats		Temp.	Time
Date 1926	%	Grams	%	Grams	%	Grams	%	Grams	%	Grams	%	Grams	%	Grams	%	Grams	%	°F	
12/13	19	190	15.0	278.5	12.3	569	13.1	575.5	14.9	283	8.7	581	10.7					73	
Oven Dry	0	165	0.0	248	0.0	502	0.0	500.5	0.0	260.5	0.0	526	0.0					220	
12/13	Storage	182	15.0	278.5	12.3	569	13.1	573	14.9	284	8.7	582	10.7						
12/13	89																	31½	6:00 P.M.
12/14	75																	33	8:15 A.M.
	84	185	17.0	284.5	14.8	596	18.2	592	18.6	293.5	12.3	616.5	17.1					35	6:00 P.M.
12/15	77																	35	8:00 A.M.
	75	187.5	18.8	289	16.7	609.5	21.1	605	21.2	299	14.5	629	19.7					30¾	5:30 P.M.
12/16	78																	30½	5:00 A.M.
	78	188.0	19.0	291	17.4	612	21.6	605	21.3	302	15.7	629	19.7					31	5:20 P.M.
12/17	79	188.5	19.3	292	17.8	613	22.0	607.5	21.8	304.5	16.7	630.5	19.9					32	5:30 P.M.
12/18	75	189.0	19.7	294	18.8	616	22.3	609	21.9	306.5	17.3	632.5	20.2					31½	5:30 P.M.
12/19	83	189.0	19.7	296	19.3	620.5	23.2	613	22.8	308	17.9	637	21.2	548.5	11.0	203	5.9	31⅓	3:15 P.M.
12/20	81	190.0	20.2	298	20.2	623.5	23.9	616	23.2	310	18.7	639	21.5	494	0.0	191.5	0.0	33¾	5:30 P.M.
12/21	76	190.5	20.6	299	20.6	625	24.2	618.5	23.8	311	19.1	641	21.9	551.5	11.0	205	5.9	27¾	6:00 P.M.
12/22	76	190.5	20.6	299.5	20.8	626.5	24.4	619.5	24.0	312.5	19.7	642	22.0	596	20.0	227.5	17.5	31¾	6:00 P.M.
12/23	78			301	21.3	626	24.3	621	24.3	314	20.1	629.5	21.6	598	20.5	235.5	21.7	30	6:00 P.M.
12/24	82			301.5	21.5	625	24.2	619.5	24.0	315	20.4	640	21.8	601.5	21.2	234	20.9	36	6:00 P.M.
12/27	85			305	23.0	629.5	25.2	624.5	25.1	319	22.1	645	22.7	609.5	22.8	236.5	22.2	33⅓	5:30 P.M.
12/28	89			305	22.8	629	25.1	622	24.7	319	22.2	643	22.3	609	22.7	236	21.7	31	6:00 P.M.
12/29	81			305	23.0	629	25.0	621	24.3	319.5	22.3	642	22.1	609	22.8	236	21.8	35	6:00 P.M.
12/31	80			306	23.6	628	24.7	624	25.0	320	22.4	642.5	22.2	609	22.8	236	21.8	32¾	9:00 A.M.

storage conditions during the latter part of December. The various types of material were weighed periodically and the temperature and humidity in the cold storage room were observed. The temperature in the room varied from 27¾ to 33½° F. during the period. Most of the observations, however, were very close to 32°. The relative humidity varied from 75 to 89 per cent. At the time the material had come the equilibrium, however, the relative humidity was 80 per cent. Table 2 gives the results of the weighings made at the various dates indicated for the various types of material under observation. The moisture content also in per cent is indicated.

The moisture content of the various types of material in cold storage was as follows:

Excelsior pads 20.6 per cent.
Cup flats 23.6 per cent.
Lime cooked straw fillers 25.0 per cent.
Lime cooked straw flats 22.4 per cent.
White spruce fillers 25.0 per cent.
Original Nu-Processs fillers 22.3 per cent.
Modified Nu-Process fillers 22.8 per cent.
Modified Nu-Process flats 21.8 per cent.

The various types of material as a whole required approximately two weeks to come to equilibrium under cold storage conditions. The excelsior pads, however, came to equilibrium much more rapidly and only required one week. The modified Nu-Process fillers and flats required only about one week. They were put in cold storage about one week after the other material. On account of being surrounded with material that was already almost at equilibrium, however, they came to equilibrium much more rapidly than they otherwise would.

The amounts of water in the packing material when it is at equilibrium under various conditions is of interest. In Table 3 is given the amount of water per case of eggs in the packing material after equilibrium in the unheated storehouse had been reached. In Table 4 is given the amount of water per case of eggs in the packing material after equilibrium had been reached in cold storage.

From a study of these tables it is evident that the combination of cup flats an Nu-Process fillers contain the least amount of water under both unheated warehouse conditions and cold storage conditions. Under cold storage conditions, the amount of water in Nu-Process fillers is about one ounce less than that contained in white spruce fillers or lime cooked fillers. The amount of water contained in the cup flats is from one to two and one-half ounces less than any combination of pads and plain flats. The Nu-Process flats, however, contain about three per cent less water than either white spruce flats or lime cooked straw flats. The low water absorbtion by the Nu-Process fillers and flats is a remarkable feature which probably explains the greater strength, stiffness, and toughness of this material under the conditions of cold storage. In the case of cupped flats, the small amount of water contained therein is a result of the lightness of the flats and the small amount of material required in their structure.

Summary

The leading points demonstrated in the tests conducted as described above are the following:—

1—Egg packing material came to moisture equilibrium in an unheated warehouse in a period of about forty-eight days. Only about fourteen days were required, however, to bring it to nine-tenths of its final moisture content.

2—Under typical cold storage conditions, the time required to come to equilibrium was only two weeks.

3—Approximately twice as much water was held by the material under the cold storage conditions as when at equilibrium in the unheated warehouse.

4—Lime cooked straw and spruce ground wood had practically the same moisture content when in equilibrium. Nu-Process stock contained three per cent less.

5—The pack containing the least water was the combination of cupped flats and Nu-Process fillers. The first on account of their low weight and the

MOISTURE CONTENT OR PACKING MATERIAL IN UNHEATED WAREHOUSE

		With White Spruce Fillers Ounces	With Lime Cooked Straw Fillers Ounces	With Original Nu-Process Fillers Ounces	With Modified Nu-Process Fillers Ounces
4 Excelsior Pads....	16 Oz.	2.16	2.16	2.16	2.16
8 Flats.....	12 "	1.40	1.41	1.20	1.20
Total.....	28 "	3.56	3.57	3.36	3.36
6 Excelsior Pads....	24 Oz.	3.24	3.24	3.24	3.24
6 Flats.....	9 "	1.01	1.05	.90	.90
Total.....	33 "	4.25	4.29	4.14	4.14
16 Cupped Flats....	20 Oz.	2.22	2.22	2.22	2.22
14 Cupped Flats....	17.5 Oz.	1.94	1.94	1.94	1.94
4 Excelsior Pads....	16 Oz.	2.16	2.16	2.16	2.16
8 Cupped Flats.....	10 "	1.11	1.11	1.11	1.11
Total.....	26 "	3.27	3.27	3.27	3.27
10 Fillers.....	38.75 Oz.	4.53	4.40	3.85	3.85

MOISTURE CONTENT OF PACKING MATERIAL IN COLD STORAGE

		With White Spruce Fillers Ounces	With Lime Cooked Straw Fillers Ounces	With Original Nu-Process Fillers Ounces	With Modified Nu-Process Fillers Ounces
4 Excelsior Pads....	16 Oz.	2.97	2.97	2.97	2.97
8 Flats.....	12 "	2.42	2.42	2.36	2.36
Total.....	28 "	5.39	5.39	5.33	5.33
6 Excelsior Pads....	24 Oz.	4.45	4.45	4.45	4.45
6 Flats.....	9 "	1.82	1.82	1.77	1.77
Total.....	33 "	6.27	6.27	6.22	6.22
16 Cupped Flats....	20 Oz.	4.25	4.25	4.25	4.25
14 Cupped Flats....	17.5 Oz.	3.72	3.72	3.72	3.72
8 Cupped Flats.....	10 Oz.	2.13	2.13	2.13	2.13
4 Excelsior Pads....	16 "	2.97	2.97	2.97	2.97
Total.....	26 "	5.10	5.10	5.10	5.10
10 Fillers.....	38.75 Oz.	8.70	8.70	7.77	7.93

Above—Table III. Below—Table IV.

second because of their relatively low attraction of moisture.

6—The moisture content of the combination mentioned above at equilibrium in cold storage was 12 ounces as compared with 15 ounces with white fillers, flats and pads.

Lessons in Paper Making

Lesson XVII—The Structural Formation of Paper (Part 1)

By HARRY WILLIAMSON
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This article is the seventeenth of a series of lessons in practical paper making, appearing each month in The Paper Industry by arrangement with the Champion Fibre Company, Canton, N. C. These lessons are a part of the general education course conducted by this company under the direction of Mr. J. Norman Spawn, educational director.

IN THIS lesson we are going to discuss chiefly the physical formation of a sheet of paper made on a fourdrinier machine. With a thorough understanding of this formation of paper on the wire as a base, we will the more easily define the **limits** of our operations to combat the troubles which frequently occur.

A clear defining of the limits within which each paper mill department can operate to put forth a product which will contribute its full quota towards the desired commercial result, is vital.

This writer has frequently stated that only the closest **amicable** interlocking co-operation between the mill departments can show a result in a balance on the right side of the ledger. Egoism, either individual or departmental, is the easiest method a paper mill can adopt to get into red ink.

"Passing the buck" is a favorite pastime in the army, merely because the final recipient, the private soldier, cannot quit. Industry, however, is wider in its scope, and unreasonable "buck passing" only results in a killing of initiative, eager effort, and finally a labor turnover.

Hence, the necessity to not only define the limits of our own operation and dependence on others, with full credit for that dependence given when success is achieved, but also the necessity to accept in good faith the report of a responsible departmental head that he has reached the limit of his operating facilities.

With **good faith**, as an accepted premise, the ensuing discussion will be more profitable and some **interlocking detail** of operation will be discovered which will materially help the situation.

In machine room operation, the fundamental base is the formation of the sheet on the wire. The sheet that leaves the couch roll is the **basic** sheet which is wound round the reel. After leaving the wire the paper undergoes further treatment which may develop or destroy the qualities aimed at but we must remember, **the development or deterioration of these qualities is in direct ratio to the fundamental base, the structural formation of the sheet on the wire.**

We know that the whole machine room operation interlocks and is directly dependent on the beater room operation. In this discussion on **formation** we must, therefore, refer to beater room operation. The **detail** of beating, the reasons for various treatments, the results, **how** and **why** each treatment is given will be dealt with in later lessons. For the present, we will confine ourselves to the **formation** of the sheet **on the wire,** because when we know the **requirements** and **limits** of fourdrinier paper formation, we will be better able to have the beater engineer prepare stock for us which can be successfully operated **within** these limits.

Formation

There are two distinct phases in the formation of paper on the wire, and we must keep clearly in mind the function of each. First, there is the physical crossing, weaving and interlocking of **the length** of the fibers while they are still **suspended** in water. Second, there is the **cohesive binding** of the fibers, resulting from the envelope of the colloidal jell of hydration surrounding each fiber, in ratio to the beater treatment, and effected on the wire by the **vibration of the fibers after they have ceased to be held in suspension.**

Each phase is important. The predominance of one over the other is dependent on the final qualities desired in the paper. Herein, then, is the key to fourdrinier operation and the guide to the **degree of hydration** we will require from the beater treatment.

In this relation, we may refer to the **shake** devices which claim to give increased strength to the paper. These claims are justified when the shake device will impart a sideways motion to the wire, which is sufficient to achieve the physical crossing of fibers and **maintain a vibration** of the fibers over the **whole length of the making surface of the wire.** This implies a shake design of delicate immediate **adjustment both as to length and speed of stroke.**

In this design and application of shake, we have a clear example as to which of the two phases of formation shall predominate.

High speed newsprint has been successfully produced without the use of a shake at all. With the high speed, we have a high slice velocity combined with a large volume of water **delivered** to the wire. The action, therefore, is sufficiently volatile to achieve the **physical** crossing of the fibers.

The duration of life required of a newspaper, is until the ultimate buyer has read the daily news. The hydration of fiber to make newsprint is, therefore, of a degree which will warrant successful machine operation only and **is not** of a degree sufficient to impart the strength and durable qualities of the better class papers. In the formation of newsprint on the wire, therefore, **the physical crossing of the fibers would be the predominant phase.**

The **vibratory cohesive phase** succeeds the physical phase. The area of wire over which each shall operate in relation to the other is determined by the quality of paper to be made.

The **conclusion** of **both** phases, however, represents the **basic formation, the structure of which is fundamentally the same at the reel end as it is at this, the concluding point on the wire.**

There has recently been a legal controversy as to "When is Paper?" Not being immediately concerned, we need not bother about the legal points involved. For our aid in running a fourdrinier machine, however, we can say: When the sheet on the wire has ceased to respond to all other influences except that of suction with its subsequent atmospheric pressure on the surface, **the basic formation is complete and, therefore, it is paper.**

In relation to the two phases of formation, this point is reached as soon as sufficient suction has been applied by the flat boxes to prevent further vibration of the fibers, generally speaking immediately **before** the dandy roll. As, however, the function of the dandy roll is to bring the finer fibers to the surface, and by its weight help to lay the sheet, thus improving the formation, we must include it as a partner to **basic** formation, **providing the sheet is worked wet under the dandy roll.**

Physical Crossing

In previous lessons we discussed the detailed action of slice velocity. The physical crossing of the fibers while they are passing over the area of wire which is under the influence of the **greatest length** of shake stroke applied, is dependent on three factors:

(1) The **volume** of water delivered from the slice to the wire.

(2) The **rate** of water drainage through the wire.

(3) The **length** of the fiber used.

The modern fine paper mills manufacture a very wide range of papers, kraft, envelope, bonds, books, vellum, soap wrapper, foil, post card, library index—each grade demanding special characteristics, bulk, strength, opacity, tear, fold, elasticity, finish. Each grade has its specially prepared finish to produce the desired results, yet **each grade is formed on the same length of wire by the same two phases of operation.**

Granted the **same length** of fiber and the **same machine speed,** an extremely free beaten stock would necessitate a far greater volume of water delivered to the wire than an extremely slow beaten stock. In the first instance, the actual physical crossing of the fibers would be greater than would be the case in the second instance, **but this crossing would be very uneven through the layers of stock which form the structural thickness of the paper.** All fibers have a strong tendency to float lengthwise with the wire. As we know, this tendency is offset by the lateral action of the shake.

In the operation of the mixed volume we have two controls. First, the slice has absolute control of delivery, then as the fibers sink from suspension, the speed of the wire assumes control.

The greater length of time the fibers are in suspension, whether this suspension be obtained by volume of free water or by hydration of fiber which retards the drainage of water, the better opportunity there is to effect the physical crossing of the fibers.

With the very free beaten stock, despite the large volume of water in which the fibers are suspended, the drainage of water would be so rapid, a large proportion of the fibers would come in contact with, and under the control of the wire **before** the shake could adequately cross and weave them together. The second layer in the paper structure would have more fibers crossed, and each succeeding layer would have a better proportion of lengthwise and crosswise fibers.

The heavier fibers also tend to sink more rapidly to the wire. The finer fibers being held in suspension longer, fill in the interstices of the upper layers. Hence the top side of the sheet has a finer texture than the wire side of the sheet. From this condition, we can arrive at two operating rules for our guidance to improve finish by formation on the wire. We can increase the hydration of the fiber, which in turn will retard water drainage and result in a **more even physical crossing of the fibers,** or, should the strength of the fiber be excessive to our immediate requirements, we can shorten the fiber. The best results would probably be obtained by doing a little of both, **hydrate and shorten the fibers.**

We can use the same set of conditions, a free beaten stock, for other examples. The wire side of

the sheet with its greater proportion of heavier fibers will show the machine grain, or direction of travel. This wire side of the paper having been formed by **immediate contact** with the smooth surface of the wire, is, however, **more level** than the top side of the paper.

The top side of the paper with its greater proportion of finer, better woven fiber, is in a more volatile condition during formation for a longer period than the wire side, and is, therefore, **covered with small uneven surfaces.**

The action of the dandy roll and press rolls will smooth out this unevenness as far as texture and finish is concerned, **but the top side of the paper will still have a greater area of surface than the wire side of the paper.** Paper will **curl, buckle,** or **cockle** towards **its shortest side. We will find the slack part, or wrinkle of cockled paper made from free beaten stock, on the top side, with the contracted or short part on the wire side.**

As we have used the term "free beaten long fiber" for our example, we must not become confused and assume that only "free beaten long fiber" will cause curling and cockling. The **immediate cause** of curling and cockling in the example is the uneven physical crossing, creating a **difference** in **area** between the two sides of the paper and, consequently, a difference in **shrinkage.**

In our lesson on Hydration, we stated "hydration helps to prevent cockling, yet, used in excess, it becomes the primary cause of cockling." In this relation, we must keep clearly in mind two well known proven facts:

(1) The water of hydration can only be removed by evaporation.

(2) When fibers are beaten so that the cellular walls are readily receptive of water, hydration, or subsequent moisture from the air, they will **expand** with water reception and **contract** with water evaporation **more diametrically** than they will **lengthwise.**

For example, we will discuss a sheet made from exceedingly **slow** long fiber. By reason of the hydration of the fiber, a considerably lesser volume of water would be delivered to the wire from the slice than is the case with free stock. The action on the wire would be sluggish, the area for the first phase, physical crossing, would be very short, while the second phase, **vibratory cohesiveness** would be in effect over a greater area of the wire making surface. The result would be **a much greater proportion of fibers** through the structural thickness of the sheet, **laying lengthwise with the wire.** This in turn would result in a sheet almost **evenly grainy** throughout its thickness. Consequently, the area of surface on the top side and wire side would be more nearly equal than a sheet produced from exceedingly free fiber.

We have apparently then created a sheet which will be free from curling or cockling. We must not be too optimistic, however; we have still to reckon with the two facts:

(1) The greater diametrical expansion and shrinkage of fiber, and the majority of our fibers are lengthwise throughout the sheet, and

(2) The fibers are excessively hydrated, and water of hydration will be removed by evaporation.

As the sheet passes over the dryers, the water of hydration is evaporated **but the adhesive qualities of the hydrate are maintained,** therefore, the fibers are **drawn** together as evaporation occurs, effecting **shrinkage.** The diametrical shrinkage is greater than the lengthwise shrinkage and this is further influenced by the mechanical necessities of the machine operation. The tension of the machine draws and the tightness of the dryer felts will tend to resist the adhesive qualities of the hydrate. Therefore, as shrinkage is effected **lengthwise** there is a tendency to disrupt rather than compact the fibers in the machine direction. We have a sheet then of greater shrinkage and compactness **cross grain** than with the grain. This will hurt the elasticity and tensile strength. The curling of such a paper may not be in evidence in the paper mill.

By beating, however, the fibers have been made especially receptive to water. Should such a paper be exposed to a moist atmosphere, the fibers will again take in water. **Expansion** would be in proportion to the original shrinkage, that is **greater across the grain than with the grain.** Such a sheet would, therefore, tend to **curl with the grain or machine direction.** The machine operator can help prevent this ultimate curling by running the machine draws and dryer felts as **slack** as possible without wrinkling the paper or losing control of the travel of the dryer felts.

Having used examples of **extremes** to show **causes,** we will use one other example to show how by knowing the cause, we can prevent the evil result.

Offset papers and papers for lithograph work are especially required to lay flat. Such papers are produced from fairly **short, moderately free fibers,** with a machine speed best suited to such a stock. The moderate freeness insures a sufficient volume of water. The **shortness** of the fiber thus provided with an adequate medium of suspension insures an **even felting** of the paper structure during the **first phase of formation.** The moderate degree of hydration will yet be sufficient to insure the **cohesiveness** of the **second phase of formation.** Such a sheet could be worked wet under the dandy roll, thus again aiding closeness of formation. In the pressing, we can again help develop the special characteristic required. Normal pressing gives the top side of the

sheet contact with the bare top rolls in the first and second presses, and the wire side of the sheet contact with the bare top roll of the third press.

We have seen how the top side of the sheet can have a greater area of surface than the wire side by reason of its small inequalities. By removing the third felt and passing the sheet through the bare third press rolls and then again through the bare fourth press rolls, we produce a sheet of more nearly even texture and area of surface on **both sides.** The moderate degree of hydration insures a moderate shrinkage and consequently less danger of subsequent expansion. Moreover, the treatment of the cellular walls has not been of a nature to make the fibers readily susceptible to the absorption of moisture from the air.

Add to this, care during machine operation to reduce all strain from the draws to a minimum, and when the printer is about to feed the sheet to his press for the fourth color, he will be more apt to say "Thank you," instead of "D - - m you."

Testing for Iron

Value of Potassium Ferrocyanide as Iron Reagent Questioned

By DR. Th. BENTZEN,
Chief Chemist, Whiting-Plover Paper Company

THE problem of determining the presence or absence of iron in water, paper, etc., has come up with me for resolution many times in the course of my fifty years' experience as a paper chemist. For a qualitative analysis of this kind, I keep my reagent cabinet provided with redistilled water, iron-free hydrochloric acid, and potassium ferrocyanide in crystal form to be prepared as a fresh 1:20 solution when needed, together with a 10 per cent solution of potassium sulphocyanide for use as control if necessary.

As a general rule, results are obtained with potassium ferrocyanide which are conclusive, as in the case of distilled water where no blue coloration would be produced. With solutions of aluminum sulphate, always more or less ferruginous, results were sometimes questionable and I was led to suppose that in such cases an error had been made or that the reagent had been contaminated, and having usually no time to investigate, I performed the test with the help of potassium sulphocyanide solution as control reagent.

Having been obliged recently to make a series of determinations that demanded absolutely reliable evidence of the absence or presence of iron, even as traces, I began with a qualitative test in order to avoid unnecessary work so as to separate samples containing no iron at all and then subject the other ferruginous samples to a quantitative (colorimetric) analysis. But such a preliminary test yielded results that could not possibly be right as even redistilled water proved to be chalybeate.

Although I was able to perform and complete the demanded determination with the aid of sodium sulphocyanide as reagent, I began experimenting in a systematic way to ascertain why potassium ferrocyanide failed as a reagent for iron, and also its tendency to turn blue when no iron was present. A schematic report of my experiments and their results are subjoined in the hope that my chemical colleagues may be induced to experiment further and perhaps lead to discussion in order that answers may be available for the following questions:

1—What is the cause of failure with potassium ferrocyanide as a reagent for iron in view of its former good reputation?

2—How must it be handled in order to obviate mistakes and erroneous results?

In order to avoid repetition, I may state here that there were used in the tests:

Iron-free redistilled water.

Iron-free diluted hydrochloric acid (10 per cent).

The potassium ferrocyanide was chemically pure of the highest grade used for analytical work, and obtained from different makers, but all of equal quality.

The salt was taken from sealed bottles and for comparative purposes from bottles that had been repeatedly opened and contents partly used, but without showing any notable difference. The reagent, used in freshly prepared solutions 1:20 is designated in the following schematic report simply as Reagent.

Experiment	Substance	Temperature	Plus	Treatment	Reaction	Remarks
1	H_2O	Cold	Reagent	None	None	
2	H_2O	Hot	Reagent	Cooled	Slightly yellow towards light olive green.	Remarkable difference in reaction under nearly similar conditions.
3	H_2O plus reagent	Heated	O	None	None	
4	H_2O	Cold	Acidified and Reagent added	None	Slightly yellow or light olive green, stronger than No. 2.	
5	H_2O	Hot	Acidified and Reagent added	Cooled	Dark blue	
6	Acidified H_2O	Heated	Reagent	Cooled	Light green	The usually "speedy" ways to perform the Iron-Test.
7	Acidified H_2O plus reagent	Heated	O	None	Dark green	
8	Acidified H_2O	Heated and then cooled	Reagent	None	Greenish but color less pronounced than 5-7.	The most careful way to work.

The test tubes used were Nessler tubes.

"Cold" and "cooled" refer to room temperature.

It should be noted that it is necessary to heat (boil) the acidified solution to oxidize any FeO present, and "hot" or "heated" means accordingly "brought to the boiling point."

The foregoing experiments appear to establish the following facts:

1—The presence of acid in **hot** solutions turns the reagent blue or green (see Experiments Nos. 5, 6 and 7) even if no iron is present.

2—By cooling the acidified heated solution before adding the reagent this false reaction is less evident (Experiment No. 8).

3—But as a whole, potassium ferrocyanide is not a trustworthy reagent for determining the presence of iron in suspected solutions.

Pointers for the Engineer

By W. F. SCHAPHORST, M. E.

Heat Through an Orifice

ABOUT two years ago an engineer was experimenting with steam. He was blowing live steam through an orifice and measuring the amount of heat that passed through the orifice in a given time.

Then he blew hot water having the same temperature as the steam through the same orifice.

He was astounded to find that the hot water carried MORE HEAT through the orifice than the steam.

His discovery led to the invention of a modern boiler feed water regulator with which most if not all engineers are already well-acquainted.

Having never seen the matter checked up mathematically, I sat down the other evening and tried to work it out roughly. This is what I found:

For flow of water through an orifice I took the formula:—

$$Q=0.61A\sqrt{2gh}$$

Where Q=cu. ft. per sec.,
A=sq. ft.
h=ft. head

Taking an area of one-hundredth of a square foot and a head corresponding to 100 lbs. pressure, I get

Q=0.525 or 32.8 lbs. per sec.

According to my steam table this is equivalent to 9,800 B. t. u. per second.

For steam passing through the same orifice I used Napier's formula which is:—

$$M=\frac{Fp}{70}=\text{lb. per sec.,}$$

Where F=area sq. in.,
p=pressure lb. per sq. in.

The area of the orifice is 1.44 square inches.

Substituting in the formula I get 2.06 lbs. of steam per second which, according to the steam table, represent 2,440 B. t. u. per second.

That is, 9,800 B. t. u. pass through in the form of water and 2,440 B. t. u. pass through the same orifice in the form of steam.

Or. in other words, at 100 lbs. per sq. in. absolute, about 4 times as much heat passes through an orifice in the form of hot water as when in the form of steam.

This, of course, is not strictly accurate because I have not taken back pressure into consideration. I would like to see it worked out more accurately by someone better versed in thermodynamics than I am. Anyway, there is no question about the fact that more heat passes through an orifice in water.

Testing Pulverized Coal

TO BE strictly up-to-date when testing the fineness of pulverized coal, avoid screens that are designated by mesh, namely, 40 mesh, 60 mesh, 80 mesh, etc.

It has been decided by scientists that designation by mesh is not satisfactory. For example, 100 mesh means 100 meshes to the inch measuring from center to center of wires, but the wires could be of any diameter from .003 to .0045 inch, each variation of size in this range making the spaces between wires smaller. It is readily apparent that a much coarser coal particle could pass through a 100 mesh sieve made from .003 inch diameter wire than could through a 100 mesh sieve made from .0045 inch diameter wire.

The new method of designating by number as recommended by the U. S. Bureau of Standards eliminates any possibility of misunderstandings.

In the new series of testing sieves as specified by the U. S. Bureau of Standards, the capacities of the sieve vary in a gradual, uniform manner—permitting a selection from this series for practically every purpose.

The following table shows how carefully this matter of sieves has been worked out.

Sieve Number	Opening Inch	Wire Dia. Inch	Sieve Number	Opening Inch	Wire Dia. Inch
4	.187	.050	40	.0165	.0098
5	.157	.044	45	.0138	.0087
6	.132	.040	50	.0117	.0074
7	.111	.036	60	.0098	.0064
8	.0937	.0331	70	.0083	.0055
10	.0787	.0299	80	.0070	.0047
12	.0661	.0272	100	.0059	.0040
14	.0555	.0240	120	.0049	.0034
16	.0469	.0213	140	.0041	.0029
18	.0394	.0189	170	.0035	.0025
20	.0331	.0165	200	.0029	.0021
25	.0280	.0146	230	.0024	.0018
30	.0232	.0130	270	.0021	.0016
35	.0197	.0114	325	.0017	.0014

Current Thought by William Sibley

What's Ahead in Business for 1928

IT IS only natural at this time of year that nearly every paper mill man should hesitate long enough to take mental stock of what has gone before and attempt to envision the obstacles or subventions of the ensuing twelve months. And in exercising introspection it is difficult to resist the adventure of prophecy. The numberless possibilities for error only lend zest to the lure of prognostication. And, for that matter, one might quite as well gratify his adventurous spirit, for in this year, of all years, one man's guess is as good as another's.

William Sibley, the writer of Editorial Comment on Timely Subjects, familiar to the readers of The Paper Industry, begins herewith a series of specially prepared articles under the title of Current Thought, in which he will endeavor to translate current affairs and economic factors into terms of our individual industrial needs and requirements—Editor.

At no time since the close of the war has there been more confusion of thought with respect to what is ahead in business. Economists whose batting averages have hitherto been high freely admit themselves to be at a total loss to satisfactorily predetermine long-range business. Several of the more eminent have reversed their conclusions time and again during the past twelve months.

All this is a result of failure on the part of business economists to develop new means for predetermination in order that they might keep in step with advanced business plus everyone's failure to recognize the importance of factors that were non-existent ten years ago. We lament the trend toward hand-to-mouth buying, for instance, yet completely overlook the fact that such a development is the inevitable result of high speed transportation. When transportation of goods was effected by slow moving boats and workmen's wages were paid semi-annually, dealers and wholesalers perforce carried large stocks. But when we transport our materials in 80-ton cars and 10-ton motor trucks traveling at high speed, then cut four days from the delivery time of orders by means of air mail or telegraphic code, we should naturally expect the distributor's stocks to dwindle.

In our failure, therefore, to develop business economics into a science that will accurately interpret the true meaning of current figures and existing trends, it is anybody's guess as to what is coming. Those inclined to be sanguine will say: Car loadings have reached new and high levels this year; our holiday trade was the equal if not the better of last year; wholesale prices show strengthening tendencies; stocks of unsold goods, carried on borrowed money, in credit are highly improbable; labor trouble are at their lowest point since the war; while not the best of all time the agricultural condition is generally satisfactory; good health is being enjoyed by both the automotive and building construction industries construction industries; highway and public works are more extensive than ever before; commercial failures during 1926 hit a low mark; recent industrial mergers are a stabilizing influence; the Coolidge policies which were distinctly friendly to Business, will continue throughout the year and probably much longer; etc., etc.

Now up jumps the pessimist impatient to say that next year will be a presidential year with its usual uncertainties; that the foreign situation clearly indicates keener, more aggressive competition; that the great steel trust of Europe will slice our profits from exports; that our enlarged manufacturing capacity will whet the already keen competition and turn commodity prices downward; that neither payrolls nor employment figures equal those of one year ago; that agitation for unsound farm relief legislation will break our treasury surplus; that the wage curve has reached its peak and will presently start

downward, thus creating expensive labor disturbances; that railroad rolling stock orders cannot be so large as last year; that per capita electric power consumption has turned downward for the first time in history; that real estate transfers are about seven per cent off; etc., etc.

Two Dangerous Factors

The foregoing is enough to make one dizzy, yet such a recital of facts does not misrepresent in any way the "picture" for 1928 nor afford a possibility for "colored conclusions. From them (and the arguments of both sides could be continued almost without end) we see this to be a period of confusion, if not actual uncertainty.

In the "pessimistic" list there are two factors, however, that warrant discussion. One needs refutation—the other consideration. Both are dangerous in that each holds potentialities for serious harm.

It will be remembered the pessimist said that 1928 would be a presidential year and therefore attended with uncertainties. Let's spike that idea right now. That 1928 will be a presidential year we all know, but to believe that the national election will affect business detrimentally is putting belief in sheer bunk. With two exceptions, our national election has never affected general business one way or the other and it will not this year. Business during 1928 may be below normal. If so, it will not be because a President is to be elected. It may be a year of real prosperity—but not because it is a year of national election.

Excepting only the reactionary 1920, there have been six presidential years since 1880 when business was above normal, and five presidential years when business was below normal. In all these years, except 1896, the business trend continued upward or downward unaffected by the period of elections.

In 1880 business was approximately 10% above normal.

In 1884 business started 10% below normal and continued to recede until it reached 20% by the middle of 1885.

In 1888 business was 8% above normal.
In 1892 business was 10% above normal.
In 1896 business was 12% below normal.
In 1900 business was 5% below normal.
In 1904 business was 2% below normal.
In 1908 business was 3% below normal.
In 1912 business was 6% above normal.
In 1916 business was 15% above normal.

In 1920 business was reactionary — it was not comparable.

In 1924 business was 18% above normal.

Five lean years—six fat years—one reactionary year. It would seem that the conviction that a presidential year means poor business is a myth.

These figures are given, and this issue with a hoary old fallacy is taken, because much harm may be done by repeating the ostrich-head-in-the-sand myth regarding election effects. A single influential industrialist or a series of only a half-dozen cancellations can start an utterly needless depression. Surely we have arrived at a time where myths cannot effect business depressions.

The second dangerous factor to be spoken of here is the present-day tendency to permit the unreasonable climbs of stock prices. Severe declines in security values invariably have bad effects on business. Plentiful money may be used to boom a market but only satisfactory earnings can keep prices up over a protracted period. Established dividends are now on a basis so liberal as to immediately reflect any sharp decline in earnings. This is a reason sufficient unto itself to warrant closer attention to current earnings than to gold reserves or surpluses.

Earnings Must Be Paramount Consideration

The National Industrial Conference Board has repeatedly assured us that less than half the manufacturers of this country ever make one cent of profit and that not more than 10 per cent of them know what are their production costs. Startling statements when made by an organization that in no way leans toward the chimerical. Furthermore, as long ago as October, 1924, this somebody predicted a disturbing shortage of trained executives by the year 1935. Indeed, is not this prediction already meeting with fulfillment if only by reason of the large number of mergers that have been consummated during recent years? To entertain the combination of companies is not necessarily an indictment on the management being absorbed, but it must be self-evident that the company making a good profit and possessing a healthy prospective future is less likely to merge with another (except as the dominant party to the transaction) than the "weak sisters" who might welcome such combination in the interest of dividends.

In a keenly competitive period, such as 1928, and in a period outstandingly characterized by the rapid succession of radical developments which have a profound effect on all industry, such as the ensuing decade, the exercise of vision and aggressive action plus constant watchfulness over net earnings are prime essentials to success. Constructive advertising and effective sales promotion will do more than anything else to meet and overcome present-day competition, while the maintenance of net earnings and the building of cash reserves is a matter of internal adjustment, conservative dividend policies, and a willingness to scrap either machinery or method in favor of that which will serve more efficiently.

The problems of tomorrow will be the problem of yesterday in aggravated form. It remains for industry to delete speculative tendencies and go forward, slowly and surely, on first principles.

The Paper Industry 1927 Safety Contest

Accumulative Severity Rates of Mills in Group C, as of October 31, 1927

Participant	Mill	Rate
International Paper Co.	Riley	0
Kimberly-Clark Co.	Neenah	0
Lincoln Pulp & Paper Co.	Lincoln	0
U. S. Gypsum Co.	Gypsum	0
Bird & Son, Inc.	Phillipsdale	.02
Kimberly-Clark Co.	Atlas	.03
The Upson Co.	Board Mill	.06
The Gardner & Harvey Co.	No. 2	.11
International Paper Co.	Winnipiseogee	.11
Kimberly-Clark Co.	Badger-Globe	.11
American Writing Paper Co.	Holyoke	.12
American Writing Paper Co.	Parsons	.12
The Gardner & Harvey Co.	No. 1	.12
Marinette & Menominee Paper Co.	Menominee	.12
International Paper Co.	Webster No. 9	.14
The Adams Bag Co.	Chagrin Falls	.16
American Writing Paper Co.	Linden	.18
Bergstrom Paper Co.	Neenah	.18
Defiance Paper Co.	No. 3	.18
The Gardner & Harvey Co.	No. 3	.25
International Paper Co.	Livermore	.29
American Writing Paper Co.	Norman	.33
Sorg-Oglesby-Smith Paper Co.	Oglesby	.34
American Writing Paper Co.	Monotuck	.35
International Paper Co.	Niagara Falls	.36
Union Bag & Paper Corp.	Cheboygan Paper	.37
International Paper Co.	Montague	.39
Sorg-Oglesby-Smith Paper Co.	Sorg	.41
American Writing Paper Co.	Albion	.44
Union Bag & Paper Corp.	Allen	.46
American Writing Paper Co.	Riverside	.48
Itasca Paper Co.	Minnesota	.55
Sorg-Oglesby-Smith Paper Co.	Smith	.60
American Writing Paper Co.	Mt. Tom	.61
Union Bag & Paper Corp.	Fenimore Sulphite	.63
American Writing Paper Co.	Gill	.64
Lincoln Pulp & Paper Co.	Lybster	.65
Union Bag & Paper Corp.	Cheboygan Sulphite	.65
Defiance Paper Co.	No. 1	.68
Union Bag & Paper Corp.	No. 5	.69
Robertson Paper Co.	Montville	.72
American Writing Paper Co.	Wauregan	.83
American Writing Paper Co.	Dickinson	1.03
Mead Pulp & Paper Co.	Peerless	1.09
Thilmany Pulp & Paper Co.	Appleton	1.69
The Northwest Paper Co.	Brainerd	3.38
Union Bag & Paper Corp.	Fenimore Paper	4.04
Lincoln Pulp & Paper Co.	Sulphite	4.41
The Franklin Board & Paper Co.	Franklin	5.68

Group A—Nekoosa Edwards Paper Co. Combined Mills .03

Group B—International Paper Co. Niagara Falls .36

Forty-nine of the original fifty-nine mills in Group C continue to show the true "Safety Spirit and Push" which is characteristic of the Paper and Pulp Section members, National Safety Council.

The contest is now entering the twelfth month, and although four (4) mills remain tied for first place, it is still anybody's race. Some of those who were among the leaders for six months or more, are now trailing or have "fallen" by the wayside.

However, they apparently have not given up hope, for several encouraging letters have been received, indicating that even a larger registration will be received for the 1928 Contest which starts January 1st.

The rules for the 1928 Contest will be printed and distributed very shortly. Members are requested to read these carefully and acquaint themselves with the conditions so that there will be no misunderstanding after the contest is under way.

The 1928 Contest will positively end June 30, 1928, and all awards will be made at the 17th Annual Safety Congress.

Don't fail to register your mills.

An Ancient Seat of Papermaking

When the student of papermaking thinks of handmade paper his mind instinctively reverts to the city of Fabriano in Italy where the Miliani family have produced handmade, animal sized and loft-dried papers for centuries down to the present time. Documents are deposited in the archives of the city which testify to the antiquity of its paper manufacturing industry. The Latin motto of Fabriano reads, "Faber in amne cudit, olim cartam undique fudit", a saying which, translated into German with an astonishing freedom by our Berlin contemporary **Der Papier-Fabrikant,** is made to signify, "von Fabriano aus wird seit alter zeit papier überallhin verbreitet", or in English, "Since ancient times paper has been distributed everywhere from Fabriano."

In Europe, besides Spain, Fabriano was the first place where paper was made from rags. The secret of rag paper manufacture was imparted to European artisans by the Crusaders upon their return from the war against the Saracens, the date given for the introduction of papermaking to Italy being the year 1272. Historical records are in existence to show that paper from the Fabriano mills was exported in the early days to Germany, Flanders, Alexandria, Constantinople and other cities. In Fabriano, watermarking with filigrane also was invented. These markings originally were placed upon the wire mould used in the handmade process. During succeeding centuries, the method of watermarking was so much improved that they came to have a very high artistic value. The incorporation of rosin with the pulp was another addition to the manufacture of paper invented in Fabriano. The finished sheets were further sized with an animal glue, just as is the practice today.

The papers made in Fabriano were numerous in the fourteenth century and it was found that they were partly sized with a mineral-vegetable compound and partly with an animal substance, while papers made during the same period in China, Japan, Arabia and Spain do not show any such improvement.

In mediaeval times Fabriano and the surrounding villages supported about forty small paper mills which in later years were merged together. Pietro Miliani, living in the middle of the eighteenth century, was the first to convert these small family mills into a single large industry. In the course of time, the mill was enlarged considerably by his children and their descendants. Now there are four mills belonging to this family, two in Fabriano and two in Pioraco, an adjacent village.

It is interesting to know that at the Miliani mills in Fabriano, operated under the corporate name of Cartiere Pietro Miliani, there will be found a number of officials from various governments, banks, and others watching the steps in the production of paper for their respective principals. The firm has a method of protecting its paper by a peculiarity of wrapping by which no paper can be stolen or duplicated. The two mills in Fabriano are credited with a weekly production of 10 tons of handmade paper and 100 tons of machine-made paper. Seven machines are operated, the motive power of the mills being electric, steam and water power.

First Commercial Forestry Conference

Cornerstone is Laid for New Industry at Meeting Called by the Chamber of Commerce of the United States

FROM the forests of New England to the redwoods of the Pacific Coast, from the timber areas of the Great Lakes to the woods of the Southland, came representatives of the Nation, the lumber and wood-using industries, and all allied interests to consider the great problem of reforestation at the first commercial forestry conference, held under the direction of the Chamber of Commerce of the United States at the Congress Hotel, Chicago, Wednesday and Thursday, November 16 and 17, 1927.

The vast import of this topic was reflected in the attendance at the conference. Men representing large corporations and known as leaders in industry; men who have gained renown through scientific research; and others closely connected with the affairs of the Government were there to formulate plans for a new industry, the growing of trees; to discuss means whereby the detriments of fire and pests and obstacles of taxation might be overcome; and to suggest methods of wider utilization and financing. A subject so vital demanded the consideration of the most highly trained and experienced men in business, science and legislation.

The meetings were held in the Gold Room of the hotel and the Wednesday morning session was opened by Mr. E. G. Griggs, general chairman of the Conference Committee. Mr. Griggs extended a welcome to those present in behalf of the Chamber of Commerce and introduced Wm. Butterworth, vice-president of the Chamber of Commerce and president of Deere & Co., Moline, Ill., who gave the opening address.

Policy Adopted by U. S. Chamber

Mr. Butterworth opened the session at the request of President Pierson of the National Chamber, who was unable to be present. Mr. Butterworth first brought out that the conference had resulted from study and action on the part of American business, on a fundamental economic question, the maintenance of our forests, a basic national resource. The National Chamber, several years ago appointed a committee on a national forestry policy, and the recommendations of this committee were approved by the Chamber. Briefly, those principles are:

Adequate forest fire prevention.

Taxation of growing timber upon the principle of the yield tax.

Increased federal research facilities.

National inventory of forest resources.

State forestry departments.

Forest management aimed to secure continuous forest production.

Reforestation of waste lands at headwaters of navigable streams by the Federal Government.

Reforestation of other waste lands by states and municipalities.

The National Chamber does not stop with the adoption of principles. One of its functions is to make those principles effective. This conference was authorized by the Board of Directors as a part of the Chamber's program to maintain the nation's forest resources by putting commercial forestry on a sound basis. The Board also authorized the president to appoint a general committee to determine the scope of this conference, and out of the discussions to draw conclusions and recommendations that it believes will aid commercial forestry.

The Public Must Be Sold

E. C. Griggs, president of the St. Paul & Tacoma Lumber Co., Tacoma, Wash., delivered the keynote address of the conference. His subject "Getting Down to Brass Tacks in Forestry" laid the matter before the conference in a most concise manner. Mr. Griggs gave the opinion that the time is past when forestry has to be sold to forest owners for they believe in it, but the time has come to sell it to the public that governs conditions to make it possible.

Commercial forestry is nothing but intelligent perpetuated lumbering. Too long it has been preached and defined by everybody but lumbermen. It is time for them to take the leadership; to consider it their business if anybody's, to analyze its terms, to present these terms to public and legislators, meanwhile, sincerely taking such steps as are warranted.

In the large, it is not a question of engaging in forestry. They are in it now, while they hold the land. It is a question of how long they can stay and how much additional cost to get better results is warranted under conditions confronted. Most forest owners who can do so, are recognizing this situation, leaving their land in better condition, guarding young growth, experimenting with forestry methods. If fire, taxes, and the promise of the lumber and pulp business in general makes it possible, they will go ahead from this point and develop commercial forestry to a still higher standard. American forest industry is big enough and sincere enough to put this thing over to success if it takes on the job.

Pioneering Commercial Forestry

As outlined, the next session of the Wednesday morning program was devoted to Pioneering Commercial Forestry. This session dealt with the handicaps that might be expected in working out a reforestation program, and was presided over by A. C. Goodyear, chairman of the session.

A City in the Forest

Mr. R. A. Long, of the Long-Bell Lumber Co., Kansas City, spoke on "Supporting a Community by Forestry." Mr. Long outlined the operations of his company when its activities were extended into the forests of the Pacific Northwest. At a strategic spot west of the junction of the Cowlitz River with the Columbia, an industrial city has been developed. This city, "Longview," is not simply a lumber community; there are factories making pulp and paper, paints and metal products. Grain elevators and canneries are building. Tremendous expansion is foreseen in the business of converting woods and mill waste into useful products.

Naval Stores Production

"Forestry and Naval Stores" was the subject of an address by Alex. K. Sessoms, president Timber & Products Co., Cogdell, Va. It was the belief of this speaker that on the South Atlantic and Gulf Coastal plains, the natural habitat of the slash and long leaf pine, Naval Stores production has assumed the most important position in all reforestation projects. The primary advantage in lands of the turpentine pine belt is the fact that they grow dual-purpose trees, which can give early and very profitable returns from naval stores while growing to sizes for lumbering.

The past has supported the lumberman's belief that naval stores were a minor by-product of lumbering operations. In the future, lumbering will typify the climax of a system of operating the trees for naval stores until they reach a size and maturity which makes cutting into lumber and starting a new naval store tree more profitable than to keep the old tree at work.

Reforestation by Paper Mill

The subject "Natural Reforestation for Pulpwood" was covered in a most interesting and instructive manner by George N. Ostrander, of Finch, Pruyn & Co., Inc., Glenns Falls, N. Y. This company has studied and practiced reforestation for some years, and Mr. Ostrander gave valuable data which included the yield of different kinds of timber over several periods, and ended with a table of conclusions which have been made by this company in the management of its forests. Mr. Ostrander's paper is published complete elsewhere in this issue.

United States Survey

W. DuB. Brookings of the Chamber of Commerce submitted a survey entitled "Regional Progress in Forestry," which revealed that 174 companies and individual owners in various parts of the United States are taking steps to maintain 21,000,000 acres of forests, and that timber is in the way of taking its place beside cotton, corn and wheat as one of the valuable crops of the country. Of the 20,826,409 acres of privately owned forest lands, 6,541,706 are in the North Atlantic region, 6,638,770 in the South, 1,840,604 in the North Central region and 5,805,320 in the West. More than half the aggregate acreage is under the management of lumber companies, but more than six million acres are under the management of pulp and paper companies.

In the North Atlantic region, a total of 50 forest owners are actively engaged in the practice of forestry. Pulp and paper manufacturers have the largest areas under management. Some of the pulp and paper companies have made marked progress toward sustained yield operation. Three companies have reached a point where forest growth balances current cutting, and several others are working toward this objective. All are depending upon natural reforestation, supplemented in some cases by planting, except one company which has established an extensive planting program.

In the South, eight paper companies and five naval stores operators, controlling together nearly a million and a half acres in addition, are either cutting by an established cutting plan or are making the necessary investigations for the establishment of such a plan. One pulp and paper company is conducting large planting operations as well, and three lumber companies have undertaken modest planting programs.

A total of 34 forest owners in the North Central region reported forest activities other than fire protection. Of these, 11 were lumber companies, 10 pulp and paper companies, 8 coal companies and 5 belong to the miscellaneous group, controlling a total area of slightly under 2,000,000 acres.

The Aid of Science

Dr. John C. Merriam, president of Carnegie Institute, Washington, D. C., addressed the conference on the subject, "What Science can do for Forestry." He made it very clear that all branches of science will contribute toward the solving of many of the problems which are apparently regarded as handicaps. Viewing the problem in the broadest sense, it seems an opportunity for an application of the principles that are constantly being derived from these studies. Industry is constantly appealing to science to bring in knowledge of the laws of matter not previously available and has thus bridged the enormous gap which for many years existed between the physical industries and the various sciences. Large sums of money have been expended by corporations to install laboratories and scientifically trained men employed to carry on research.

A study of the forest does not consist of trees standing side by side, but certain groups of trees associated with certain surroundings, soils, insects, chemical and physical reactions. To wipe out the forest and put it back, requires a knowledge of what the forest is like and affords an opportunity to begin the study of the forest as it was during the billions of years since it has been built. Scientific experiments will also disclose a growing variety of uses for forest products. The history of the world records the fact that constructive movements which have capitalized the future, reaped credit in the present.

LUNCHEON MEETING

Following adjournment of the morning session, the conference met in the Balloon Room of the hotel for the luncheon meeting. The luncheon was excellent, and on every hand were spirited discussions and a growing appreciation of the movement. An interesting innovation was the address on "Commercial Forestry and American Business" by Lewis E. Pierson, president of the Chamber of Commerce of the United States, which was transmitted to the conference by record through the courtesy of the Victor Talking Machine Co.

President Pierson's Eight Points

First—Forests cover a greater area than all the cultivated farms. The industries dependent on them rank fourth in the nation. Where virgin forests still are harvested, business is active; where they have disappeared, it is often stagnant. They regulate the flow of streams, prevent soil erosion and insure an abundance of pure water. National welfare demands the perpetuation.

Second—Throughout the country all manner of industries dependent on the forests now realize their common interest in this source of their prosperity and are eager for measures to maintain forest resources.

Third—The progress of commercial forestry gives promise of ample supplies of wood for the future. After all, forests, although slow growing, are crops, and like agricultural crops, they can be renewed.

Fourth—American private enterprise rather than Government will meet the problem of maintaining the nation's forest resources. This conference proves it. American industry appreciates, and is resolved to shoulder its responsibility.

Fifth—It is clear to this conference that the requirements for extending commercial forestry are—adequate fire protection, appropriate taxation systems and knowledge of how best to practice forestry, and manufacture, distribute and utilize the product to best advantage without waste.

Sixth—Teamwork for prosperity among industry, the public and the Government is the only agency that can accomplish the desired ends. The conference is a product of such teamwork.

Seventh—When economic forces called for dealing nationally with the problem of maintaining forests, it was not chance that the National Chamber formulated the underlying principles. Keeping pace with the improvement of industrial methods and organization, American business has advanced from individual to local trade organization, from local trade organization to national organization.

Eighth—The responsibility of making commercial forestry practicable rests on the public. Public support is needed also for equitable taxation measures.

As Viewed by the Government

Following the outline given by President Pierson, Wm. B. Greeley, U. S. Forester, Washington, spoke on "National Aspects of Forest Fire Protection." Mr. Greeley's address was intensely interesting and revealed a wide knowledge of the subject, also a keen foresight as to future developments.

"The conception of our forest problem which you have just listened to in the words of President Pierson, agrees very closely with the general viewpoint which underlies our present national policy. You are all familiar with the broad survey of our forestry situation made several years ago by representatives of the National Congress in an effort to find out just where we stood; just how our timber would be grown, and what the part of the National Government should be in growing it. The results of that survey have been written in the Clarke-McNary act, and it, too, like President Pierson, views the forest problem of the country as primarily an economic problem. It views the growing of timber as primarily the sort of thing, which, under our American traditions, should be reached by business initiative and efficiency. But it also asks what are the obstacles to industrial forestry which lie in the path of possible achievement, and in what way should the public busy itself in removing these obstacles? The views of the Clarke-McNary law are if fires are kept out of the woods and if taxes are kept down, American initiative will

do the rest. These two particular objects for public effort, the control of the fire hazard and an equitable dealing with the problem of forest taxation, were made the main subjects of the Clarke-McNary law.

Organized Fire Protection—"Now in keeping fires out of the woods, we have reduced former legislation into a comprehensive plan of Federal co-operation with the states and private forest owners, and it is probably fitting I should give this conference something in the way of a report as to how far we have gone in the execution of that plan. There are 39 states in the union which have important forest areas, which require organized protection from fire. This year 33 states are co-operating with the Federal Government in organized forest protection. Next year 36 states will co-operate. In terms of acreage, out of about 381,000,000 acres of state and private forest land which needs protection, a little over half, or 196,000,000 acres, are today receiving organized and systematic protection.

Financial Progress—"As a financial proposition, our task is not yet half done. We have made careful estimates of what it would cost to place systematic protection over all of our forest lands on the basis of the experience thus far obtained. It may be of interest to you to know that the average cost upon which we have agreed, taking North, South, East and West, and striking an average comes out at about 27 mills per acre, which means a national total of about $10,000,000 per year should be required to deliver a finished job of forest protection. We are only about half way. Our present yearly expenditure aggregates $4,670,000, of which the States provide 41 per cent, private forest owners 44 per cent and the National Government 15 per cent. The expenditures of the National Government for this purpose are increasing from year to year, but still are far behind in comparison of National responsibility and an acceptance of a specific share of the burden which was written into the law. The Federal Government is ready to step in and co-operate when a beginning has been made, but cannot take the first step.

Fire Loss Decreasing—"We are a long way from obtaining our goal of making forest properties in the United States an insurable risk, and by insurable risk I mean the strict commercial interpretation of that term, but we are on our way. We are gaining ground year by year. In the actual record of fire losses, there is not overly much reason for pride of accomplishment, but still there is some. In the last year of record, 1926, there were still some 91,000 forest fires in this country, and they burned over some 24,000,000 acres of forest land of all sorts, but the most striking phase of those records is that over 63 per cent of the fires and 80 per cent of the areas lost occurred in regions where there was no protection. Out of every thousand acres under organized protection of the Federal Government in 1926, the area loss was 16½ acres, whereas out of every thousand acres unprotected, the reported fires, the ones we know about, represent an average loss of 106 acres, so that a comparison of such records would indicate while we still have a long way to go in making America safe for industrial forestry, yet we have good ground for showing that forestry protection pays and that forestry protection is thoroughly feasible.

Education in Fire Prevention—"There are some very interesting developments in our forest protective work. Among them I would emphasize particularly the prevention of forest fires by educating people not to set them; the old idea that the ounce of prevention is worth more than the pound of cure. For some two years now, a co-operative provision has been carried out in the most hazardous fire section of New England, the region of Cape Cod. The result of the two years of this work shows that the total amount spent for forest protection has been 11 per cent less than under the old scheme where we had heavy fire fighting bills to pay and the acreage loss was cut considerably.

"Today in many sections, we are going into the back country, to the people who do not read many newspapers or many magazines, who do not belong to civic clubs, who are shut off from most of these influences that have an effect upon public opinion, yet the very class of people who are most persistent and determined in adhering to the ideas of their fathers and grandfathers. We are getting back to the people of that time, to the moving picture reel taken in their own communities, and we are trying to sell those people on the proposition that keeping fires out of the woods is of direct benefit to them and to their community. I can cite instances where that sort of educational campaign has resulted in reducing both the forest fires and losses by over fifty per cent, and in regions where wood burning was almost the universal practice.

"Now it costs real money to do this work, but many of the forest protection agencies of the country are learning that we can get more real protection for the money we have, by systematic localized education to prevent the forest fire from starting, rather than by incurring the cost of extinguishing a conflagration.

Codes and Fire Weather Bulletins—"I want to refer to the progress that has been made in developing a code of fire safety in logging operations, particularly in the logging operations of the west, where necessarily the period of active logging is coincident with the period of the fire hazard. There has been a noticeable decrease in the last few years in the number and severity of fires originating from western logging operations and there is a reason for it. You can find it in the increased intensity of interest and attention to the fire safety code of the western logging operation, the elimination of coal and wood burning machines as far as praticable, the introduction of electric, gasoline and oil-burning equipment. You will find it in the development of fire-fighting apparatus, the gasoline pump, the tank car, the tank automobile or automobile trailer. You will find it in the restrictions being placed today upon smoking. You will find it in the camp fire boss, whose primary job is to see that no fires get started, and more than all, you will find it in the idea that is permeating many logging operations, that it is the business of every man on that job to see that no fire gets out.

"Another interesting development of that same sort is the way we have learned to use fire weather warnings. Today the weather bureau is giving many sections of the country warnings of fire weather exactly analogous to warnings of storms. We have learned to interpret the conditions leading up to the period of exceptional fire hazard when atmospheric moisture may be exceptionally low and days of extreme severity occur. When these warnings come 24 to 48 hours in advance, it not only enables special precautions to be taken, but it enables many logging operators to shut down their machines in particularly hazardous locations, and you will be surprised at the extent to which that is now voluntarily done in portions of the west. You might be surprised to know that logging insurance is now being written and accepted on stocks on which it is written that operations will be suspended when the atmospheric moisture drops below 35 degrees.

The Work is Progressing—"Now in these ways and others like them, our ideal of making forests an insurable risk is gradually getting stronger. We still have a long way to go, but we are by no means standing still, and all the experiences of these later years simply confirm our belief of the earlier years and adds to the importance of forest protection. It seems probable that out of 470,000,000 acres of forest land in this country, at least 85 or 90 per cent will respond to the persistent elimination of the wood fire with a valuable form of timber growth. Nature has been wondrously kind to our forest regions to a degree almost unparalleled elsewhere in the temperate zone. It is true that we have a burden of denuded land on our hands as a result of destructive logging practices and repeated burnings, and it is going to require a large degree of planting.

"After everything has been said, the basic thing to American forestry is to keep the fires out of the woods, and to the extent we can accomplish that, to the extent we can make insurance available to the timber owners—because our fire records show from the actuary standpoint that timber is a safe risk at a reasonable premium—to the extent we can bring that about, we are going to lay the essential foundation for industrial forestry.

Industrial Organization—"There are one or two other subjects. I would like to connect them directly with the words of President Pierson when he referred to the fact that the organized business of America was ready and able to assume this work of reforestation. This is a very fine self-reliant creed. I want to point out two or three places where there is an application of that creed.

"There are still large gaps in our forestry protection of the United States; still lands aggregating something like 185,000,000 acres where there is no forest protection at all, or protection of such an ineffective character as not to bring results. I have been studying some of these areas, and in nearly every case I find that the primary reason why we still have that big gap is because of lack of local industrial leadership that is efficiently well-organized and well-sold on the proposition to put across a fire protection program which that section of the state or states needs. I have two southern state in mind; both of them well recognized for economic progress; both of them perfectly able to carry through economical public development. Each of these states has had a forestry department for better than a dozen years. Each has done excellent work to the extent that facilities were provided for it, and yet, today, in 1927, we find in one of these states only 60 per cent of its forest lands under protection, the rest unprotected. In the other, only 50 per cent under protection, the rest wholly without. Each of these states with better than two-thirds of forest lands out of their total area. In each of them, forestry must have an important part in their future growth. Why are those states today unable to give out a protective system which is obviously required? In those states, there is no body of industrial leadership sufficiently alert to fight the political and legislative battles that must be fought to put forestry legislation on the maps of those states. That is a typical situation in many sections.

"I want to commend particularly, for the interests represented by this conference, that form of local industrial leadership in meeting these problems in your own states. There is just one other thing I want to mention. I can sum it all up by telling you what happened in Oregon the summer of 1924.

"The Southern Pacific Railway wanted to build a new line across the Cascades traversing 60 or 70 miles of virgin forest. It was the dryest summer Oregon had known for years. The prospect of turning a large number of men into this work was extremely hazardous. But the contractors agreed to put into effect any precaution the Government might require. They went ahead. The entire operation had its fire boss whose sole job was to check up on fire regulations and equipment. Every camp was equipped with three or four powerful gasoline pumps as well as the usual supply of tools which were reserved for fire fighting. Slashings were burned at night in the middle of the right of way, and every slash fire had to be drenched out with water. When the weather reports gave warning they did not burn anything. The right of way was put through at a time when we had one of our most hazardous fire years, and today the virgin timber along that right of way stands unscathed.

"That simply indicates what can be done when a commercial organization takes the job of keeping fire down as seriously as it takes the job of building what it is out to build, or manufacturing what it is out to manufacture, and when such organization is applied to a fire job, the same information and knowledge of equipment will bring results.

"To the best of my knowledge and belief, this instance I have just described is the first time in the building of extensive railroad lines through the western forests that the building of a railroad has not been accompanied by a more or less serious burning-out of the country around. That, gentlemen, is the type of industrial approach that we need for this job of fire prevention as it comes direct to the individual commercial timber holdings. We cannot get good fire protection or complete fire protection simply by passing federal or state laws, or making appropriations, or building look-out towers as effectively as that kind of an organization is.

"I can cite many examples to show how effective such a program can be, once a company is thoroughly sold on the idea of keeping fire out of its works or woods, and goes at the job.

Government Asks Industrial Support—"I want to suggest to the interests represented at this conference that they carry that conception of industrial support of forest protection back to their operation. We represent the National Government of the States. We are going to do our utmost to deliver a 100 per cent job of fire protection, but we need the support of the forest industries and allied industries by showing in their own operations just what a 100 per cent of industrial fire protection can be."

WEDNESDAY AFTERNOON SITTING

The Wednesday afternoon meeting was divided into two sessions; the first given to a discussion of Forest Fire Protection, over which John W. Blodgett, session chairman, presided.

Reduces Fires to Minimum

Mr. Blodgett, representing Blodgett Co., Ltd., Grand Rapids, Mich., spoke on "The Goal in Forest Fire Protection." It was explained by the speaker that there were two distinct angles involved in working toward this goal of the irreducible minimum of forest fires. First, there must be created a more acute fire consciousness until everyone beyond the age of childhood will naturally feel it just as culpable to be careless of fire in a forest young or old, as it is in a building filled with inflammables. Second, in all forest regions there should be established adequate protective organizations equipped with proper facilities and manned, or at least directed, by men who know their job and how to do it. The State has perhaps the most direct interest in forest protection and regrowth. As its forests are converted into lumber and paper, it not only benefits from the huge sums paid out to its citizens for wages and supplies, but also from the additional taxes on plants and inventories.

Regional Progress and Needs

The interest of the conference was directed particularly to different sections of the country, where unusual menaces prevail.

The South—F. H. Farwell, vice-president of Lutcher & Moore Lumber Co., Orange, Texas, portrayed the roaming razorback hog as the most destructive enemy of forest growing in the south. The State of Arkansas gets credit for the introduction of this famous breed of hogs to the world. These animals, running wild, do inestimable damage to a forest. They prowl over a wide area rooting for tender shoots, and when they have finished the job a section is void of little seedlings, while the ground looks like a ploughed field. They are oftentimes considered a greater menace than fire.

Appalachian Hardwoods—The American sportsman, the hunter and the fisherman, were characterized as the greatest destructive agents to the forests of the country by W. D. Tyler, vice-president of the Clinchfield Coal Co., Dante, Va. His carelessness in using fire is not only laying waste wide forest areas and destroying timber, but is hastening the destruction of the game and fish upon which he depends for his sport. The states in the Appalachian hardwood section are sending their merchantable trees to market more rapidly than any other timberland area. In less than twenty years, the virgin growth in Virginia will be entirely exhausted, and this may occur earlier in other states. The necessity for forest fire protection has long since become imperative. Without it, many a denuded hillside will soon become a wilderness, with young growth and even soil gone. Successive fires completely destroy both these assets.

Report of Committee on Forest Fire Insurance

John L. Kaul, president National Lumber Manufacturers' Ass'n, Birmingham, Ala., also chairman of the Forest Fire Insurance Committee, presided at the second session of the afternoon and read the following report of the committee:

In the belief that forest fire insurance is a factor which should be considered in connection with the future problems of commercial forestry, this subject was included in the agenda of topics to be discussed at this conference. Because of a lack of data it was decided to appoint a special committee prior to the conference for the purpose of making a study of forest fire insurance and reporting its findings to this group. Accordingly, a committee was appointed by the president of the Chamber of Commerce of the United States consisting of five timber representatives, all of them owners of timber land, and five fire insurance members, representing stock and mutual companies and also fire insurance agents.

This committee is unique in that it is the first group in which timber land owners and insurance executives have been brought together for the purpose of discussing problems incident to forest fire insurance. Two meetings have been held, in the course of which there has been a thorough discussion of the subject from both the insurance and timber land owners' viewpoints. The following report summarizes the findings of the committee to date and also includes its recommendations which are respectfully submitted to this conference:

History of Forest Fire Insurance in the United States—The committee found at the outset that very little forest fire insurance has been written in the United States. For a number of years the Globe and Rutgers Fire Insurance Company of New York has written this class of business on a small scale, chiefly on timber on which there were bank loans. The company has made no attempt actively to solicit this business, it usually having been written upon request. At present, a relatively small amount of forest fire insurance remains on the books of the company.

The Phoenix Assurance Company of London is said to have solicited standing timber insurance in the United States in 1916, confining its efforts to Oregon and Washington. This venture was discontinued in 1918 presumably because the demand which had been expected did not materialize.

In 1917, the Timber Lands Mutual Fire Insurance Company was incorporated in New Hampshire for the purpose of dealing exclusively in standing timber insurance. After about two years' experience the company turned over nearly $400,000 of insurance to the Globe and Rutgers Fire Insurance Company on spruce, fir and pine in Maine, New Hampshire and Vermont. The risks were well scattered and the individual limits were low. Little of this business is in force at present.

The Home Insurance Company of New York has written about $30,000 in premiums on this class of business in the last five years, chiefly in the New England States. Losses have been light, but it is stated that the entire premium income of the Company on this business in the past five years could easily be wiped out in a single year.

There may have been other companies which have written timber insurance in this country, but these are among the outstanding examples. It was readily apparent to the committee that this slight experience could not be relied upon in reaching a satisfactory conclusion as to the feasibility of forest fire insurance in the United States today.

Advantages of Forest Fire Insurance—The history of fire insurance in America shows conclusively that the insurance companies are quick to respond to demands for new forms of insurance protection and coverage when they are assured that the demand is considerable in extent, that the risks offered may be properly covered by insurance and that the companies may obtain a sufficient volume and spread of business to conform with sound underwriting principles. With respect to forest fire insurance, the demand has not been sufficient to date to warrant the expenses which would be involved in actively soliciting the business.

This is possibly explained by the fact that it is only at the present time that we are beginning to enter the period of economic development wherein it is cheaper to grow timber for production than it is to cut that which is standing. It is admitted that the two main problems to be considered in connection with reforestation are taxes and fire. This committee is not concerned with taxation, but with the subject of fires. Forest fire insurance, if available to those who practice reforestation, would serve the double benefit of protecting the outlay of capital involved and of assisting in bringing about the adoption of better fire protective methods because of their influence upon insurance rates. In other words, the owner would realize it would be to his financial advantage to provide adequate fire protection and thus there should be a tendency towards further reduction of forest fire losses.

Another advantage of forest fire insurance in connection with the economic phases of reforestation is the fact that it would facilitate the granting of bank loans for growing timber. Insurance is the keystone of America's credit structure in practically every field of endeavor, and therefore if credit is to be extended to timber land owners, it is only logical to presume that the banks of the country will desire the security which arises from complete insurance protection.

On account of the length of time required to grow forests, in the case of an individual owner rather than a corporation, the proceeds will of necessity accrue to heirs instead of to the owner himself. At the death of the owner, the sole inheritance or a large part of it may consist of a growing forest. Over a period of years, there is always the constant threat of fire destruction with the result that should a fire occur, the heir will get little or nothing. Forest fire insurance would protect such inheritances.

Present Demand—It is the conclusion of the comittee that the first step to be taken in making forest fire iinsurance available on a nation-wide basis is to ascertain the possible demand. Because of the short period of time which has elapsed between the appointment of this committee and the Commercial Forestry Conference, it has been impossible for the committee to make even an estimate as to the willingness of forest owners to insure their timber against destruction by fire. However, the committee has secured information on the subject which is of interest.

Last year the Western Forestry and Conservation Association mailed several hundred questionnairies relating specifically to the subject of forest fire insurance to prominent concerns in the states of Montana, Idaho, Washington, Oregon and California. Most of the replies were either indefinite or contradictory with the result that they had to be disregarded. About 60 contained useful data and of these there was a fairly even division between those interested in forest fire insurance and those not interested. Those that were interested represented about 800,000 acres of standing timber with an insurance valuation of about $54,000,000. The acreage was well spread, each of the five states being represented. Suggestions as to a reasonable rate for forest fire insurance varied from one-half per cent to five per cent, the average being nearly two per cent. In addition, in five questionnaires there were proposals to insure reforestation on cut-over land in California, Oregon and Washington totaling 1111,000 acres. These were in answer to a question regarding interest in insuring the carrying costs on such land, rather than the undeterminable expectation value of the crop.

The committee of the Western Forestry and Conservation Association which was studying this subject was of the belief that the small number of replies was due to the fact that no actual proposals were offered for consideration and stated in its report that it was reasonable to suppose that timber land valued at $100,000,000 would be offered for insurance if some specific satisfactory terms are suggested.

This study on the Pacific Coast apparently represents the only systematic attempt which has been made to ascertain the demand for timber insurance. Based upon the experience of the Timber Lands Mutual Fire Insurance Company, the Globe and Rutgers Fire Insurance Company and the Home Insurance Company in the New England States, the committee feels there may be a possible demand in that section, as well as in the Adirondack region. In the South there seems to be little demand at present, although it is possible that further interest will be aroused later on. No information has been received regarding opinion on forest fire insurance among timber land owners in the Central States such as Wisconsin and Michigan.

Since there is so little indication of popular demand on the part of forest owners for fire insurance, the committee feels that the first logical step to be taken is to scertain whether or not a sufficient number of timberland owners would be interested in taking out this form of protection, assuming that it can be provided on a satisfactory basis to both the insurer and insured. Accordingly, the committee recommends that:

> Immediate steps should be taken to sound out the thought of representative timber land owners, such as those assembled at this conference, to determine their opinion as to the efficacy of forest fire insurance and also to ascertain whether they would be interested in protecting their holdings by fire insurance if the coverage is placed on a mutually satisfactory basis.

Further Study Necessary—Assuming that a considerable demand arises for forest fire insurance, the committee is of the belief that much more information than is now available should be developed before any endeavor is made to write this class of business generally. If an investigation of all factors involved is made beforehand the rates should be equitable. On the other hand, should the insurance companies endeavor to provide this coverage without sufficient data as to the effect of hazards in various species of timber and the protection facilities which are now in use, the rates would necessarily be experimental. It has been said that the lack of demand evinced to date has been due to the fact that rates have been high, but on the other hand, the committee recognizes that the rates have necessarily been high because of the experimental nature of the coverage. The committee therefore recommends:

> It is in the interest of both the fire insurance companies and the timber land owners to have a thorough investigation made of essential factors involved in forest fire insurance in order that equitable rates may be promulgated on a basis which will be as scientific as possible in light of present information and knowledge.

Factors to be Investigated—The committee has made a résumé of the subjects which it believes may be investigated advantageously in order to secure essential basic data. These subjects are as follows:

1—Data should be compiled through such resources as the forestry service, the state forestry departments, associations of lumber, pulp and paper manufacturers, timber land owners and forestry experts to show the average annual losses by fire over the longest periods obtainable, by area, by volume, by species and by value, all compared with the total values.

2—The common species of timber should be studied as to their susceptibility to fire at various ages and also as to possible salvage.

3—The relative risk of timber land adjoining railroads, towns, highways, cuttings, sawmills, etc., should be determined.

4—The causes of fire such as sparks, lightning, campers, clearing land, etc., should be tabulated by per cent.

5—The numerical frequency of fires together with the average extent of fire should be determined sectionally.

6—The immunity afforded by various forms of protection, such as patrols, mountain lookouts, telephones, adequate first aid appliances and tools, co-operation, outside assistance, etc., should be determined.

7—An investigation should be made to determine the amount spent per acre per year for fire protection and the values covered in various sections of the country.

8—The relative risk in old growth, second cuttings and plantations should be investigated.

9—The slash risk along railroad right of way, highways, boundaries, etc., and the length of time to decay should be studied.

10—The effect of prevailing winds on the fire risk should be studied.

11—The average number of days a year when humidity is below the danger point should be studied in relation to forest cover and other hazards.

12—The average cost of field inspections should be determined.

Extent of Investigations—While it would seem highly desirable to have the research investigation outlined above cover the entire country, it is impossible to state at this time whether or not this wide scope would be wise and economical. If a demand for forest fire insurance should arise in all quarters, it would obviously be advisable to extend the investigation to all sections of the country. However, if interest develops in forest fire insurance only in certain sections of the country, from the standpoint of economy it would seem feasible to confine the investigation to those sections. While it is natural that insurance interests prefer the fullest information possible, and while it should be obtained eventually, it may be determined that insurance on a practicable basis can be provided in a few sections of the country if sufficient volume is offered and if a spread of risk commensurate with the volume would give essential safety to individual insurance carriers.

Preliminary nation-wide organization for study would likely prove a waste of time and defer results unless a national demand is forthcoming. This is especially true inasmuch as the investigation would cover sections offering relatively little in the way of co-operative facilities. In certain sections of the country, interested agencies have already obtained through experience considerable data which will be helpful in the proposed survey and it is likely that in those parts of the country, such as on the Pacific Coast, the initial demand for insurance coverage will be manifested.

On the Pacific Coast, for example, considerable protection experience is now available. Weather reports and weather study, together with evidence which the forests themselves offer regarding fires pre-dating existing records are being worked out jointly by the Weather Bureau and the protection agencies.

The committee accordingly recommends that:

> In the interest of economy and from the standpoint of practicability, the extent of any investigation of factors affecting forest fire insurance should be limited for the present to those sections of the United States in which there is apparent willingness on the part of a substantial proportion of timber land owners to carry fire insurance on their forests and, in making an investigation, the experience available to date should be used to the fullest degree.

Methods of Making Investigation—In order for forest fire insurance to be successful, the insurance companies must be assured of sufficient volume and spread of business so that an individual company will be able to proceed in accordance with sound underwriting principles, thus avoiding the possibility of an extremely heavy loss on a single fire. It is also recognized that it would probably be necessary for a group of companies to agree to write this class of business in combination in order that large individual risks should not be limited to single companies. If a favorable demand for forest fire insurance protection should result, the first step to be undertaken by the insurance carriers would be to ascertain the willingness of a group of companies to provide this coverage in combination. As soon as such a group is formed it is likely that it would at the outset make such an investigation as would be desirable from the standpoint of the companies. It is possible that they would wish to secure data on a number of the subjects mentioned previously in this report. In this case, it would be unnecessary at the start to establish any independent organization to make a study. Quickest results could be obtained through direct contact between the insurance and forest interests. Direct consultation would develop the requirements and needs of both sides and would also indicate what each could contribute in facilities.

If it is finally decided by the insurance companies and the forest owners that forest fire insurance can not be placed on a practicable basis without further independent investigation of factors involved, it may be necessary to recommend the creation of additional machinery to undertake a complete study. The question will then arise as to how such a study should be sponsored and financed.

The committee is of the opinion that this final study, if

made, should be handled under private auspices. This should be financed by interested lumber, timber, paper and pulp and insurance associations. It is estimated that the investigation would probably require a year. The services of a forestry expert who is insurance-minded should be employed to direct the investigation and prepare a report. As considerable field work may be involved, it is possible that he would require one or more assistants during at least a part of the year. If two such assistants are employed, it would seem logical for one of them to be a forester and the other an insurance man. The staff would probably be complete with the addition of one stenographer during the period of the investigation.

The offices of the Chamber of Commerce of the United States would be available to this staff in making the study, thus effecting a considerable saving for office expenses. This would have the further advantage of providing direct supervision by the Natural Resources Production and Insurance Departments of the Chamber.

At the proper time and certainly not at present, a tentative budget should be worked out to provide the necessary funds for the investigation. Interested organizations may then be asked if they would be willing to contribute on a pro rata basis according to their size and income. Further developments would depend upon the response received. In the event it is favorable, immediate steps could then be taken to get the investigation under way.

The committee recommends that:

Where there is a favorable demand for forest fire insurance, it is suggested that the interested insurance companies collectively make a preliminary investigation upon manifestation of such demand and confer with associations of forest owners located in sections from which the demand arises in order that insurance protection may be made available as quickly as possible if the terms are satisfactory to both sides.

Should it be decided by the two groups, however, that further investigation is desirable, the latter should be conducted under private auspices and financed by interested associations, each contributing on a pro rata basis.

THURSDAY SESSIONS

The first session of the forenoon was devoted to the subject of Forest Taxation and was presided over by R. E. Danaher, session chairman. Upon opening the meeting, Mr. Danaher stated that he believed the subject of taxation was the greatest problem for consideration. It is evident that some change in forest taxation is necessary, and this gives an opportunity for the public to express an opinion through the medium of the press. He then introduced Mr. Glenn Griswold, editor Chicago Journal of Commerce, who spoke on the subject "Why Adjusted Taxation is Necessary."

Adjusted Taxation

Mr. Griswold declared that there is no function of government in which there is less of common justice and less of intelligence applied. So far as the necessity for adjusted taxation is concerned, it seems more obvious than any tax reform ever thought about or discussed. The whole structure of forest taxation up to very recent years has been that we should penalize the growing of trees and impress a premium upon the cutting or destruction of them. We have taxed trees in growing forests as we would tax other assets from year to year.

If the taxation laws of some 40 or 42 of the states of this country could be so amended that the growing of trees was relieved of a tax burden, and that the destruction of trees to some extent penalized, all the other problems might be solved.

Tax Laws

Several speakers from various states read tax laws in operation in those states, and cited instances where these laws were inadequate or had not been properly applied. Suggestions to amend these laws were also given.

Fundamental Principles

"Principles of Forest Taxation" was the subject of an address given by Fred R. Fairchild, of Yale University. Mr. Fairchild said that his remarks would be a statement of fundamental principles which he believed should govern any movement toward reform in forest taxation. While he had full confidence in these principles, he expressed himself as prepared to modify them in case much modification should be indicated by the results of his present investigation.

After pointing out that the special problem of forest taxation arises from the imperfections of the American general property tax, he stated that he had no faith in special concessions of any sort, but believed that any plan adopted should aim to impose upon forest owners their fair share of the cost of government on a par with other taxpaying interests. Equality of tax contribution does not necessarily imply uniformity of tax method.

The speaker then gave consideration to several possible forms of forest taxation in particular:

(1) The property tax upon the value of the forest exclusive of growing trees.
(2) The income or yield tax with no property tax on the land or trees.
(3) A combination of property tax on the bare land and yield tax on forest products.

By way of warning, it was stated that the ideal system of forest taxation to be attained should be such as will make possible the employment in forest growing of all idle lands not more valuable for agriculture or some other use.

Possibilities of Commercial Forestry

The remainder of the forenoon was given to a consideration of Possibilities of Commercial Forestry. E. L. Carpenter, session chairman, opened the subject, using as a basis for his remarks, "Perpetual Production of Timber Requirements, and Stabilized Land Utilization." The speaker recalled statements made a number of years ago by prominent men which implied, if not definitely stated, that about fifteen years would practically exhaust the timber supply of the United States. Today it is known that the over-production stage of the lumber business was not reached until many more years than the fifteen had passed. As a result of the misconception arising from such statements, the lumber business was for many years misunderstood by the Government, and by people generally throughout the country. A lumberman was many times looked upon as at least a despoiler, and possibly a malefactor.

Sustained Yield

As a measure of the necessity of putting the forest lands of the United States on a productive basis, David T. Mason, Mason & Stevens, Portland, Ore., pointed out in his address on "Importance and Possibilities of Sustained Yield," that the country is depleting its softwood resources at the rate of 37,000,000,000 feet annually. If we are to come anywhere near meeting our future softwood requirements, we must start production. Recent changes in government policy, together with the careful study of possibilities by the private land owners will result in the wide introduction of sustained yield forest management, which will solve the problem of American timber supply, the problem of communities dependent upon forest industries, and will bring prosperity to the forest industries.

Speaking on "Commercial Practicability of Sustained Yield," R. B. Goodman, Goodman Lumber Co., Marinette, Wis., predicted that the hardwood timber resources of Northern Wisconsin and the Upper Peninsula of Michigan will in thirty years begin to increase as a result of commercial forestry efforts. Many states are now pursuing the policy of depending upon private enterprise to perpetuate their forest resources. The hardwood lumber production in Northern Wisconsin and the Upper Peninsula of Michigan will gradually decline for the next thirty years, when the effects of reforestation should bring about an increase of the available merchantable sawtimber. The situation with respect to pulpwood supplying the local paper mills is somewhat similar, but fire

protection measures and planting will bring about an increased supply of pulpwood in a considerably shorter period. Projecting ourselves into the year 1960, successive cuttings on virgin timber and the reforestation of destructively logged timber areas should produce a satisfactory sustained yield timber stand by that time.

THURSDAY AFTERNOON SITTING

The keen interest manifested during the entire conference did not wane toward its close. The final session Thursday afternoon was very well attended and the closing addresses received the undivided attention of all present.

Forest Research

R. B. Robertson, president of the Champion Fibre Co., Canton, N. C., spoke on "How are we to Obtain Fast Growth of the Right Kind of Timber?"

This subject was handled from the viewpoint of conditions as they are in the South, where much disorder exists in the forests owing to fallen and decayed timber. The primeval forest is often an over-ripe forest, a forest gone to seed. The life story of the tree as indicated in its annual rings of growth, furnishes ample confirmation of the assertion that growth is stimulated by the removal of larger trees. Frequently, there exists a long series of narrow rings, followed by an equally long series of much broader rings, the abrupt change indicating a sudden access to light, which could only have come about by the elimination of an overtopping neighbor. Therefore, the first suggestion made in answer to this question was that timber should be grown by cutting timber.

Co-ordination of wood using industries was regarded as a contributing factor. This country has been far too prone to think of commercial forests in terms of saw logs only. If the forest contained no logs big enough to make boards, there has been an inclination to consider it worthless and to turn to virgin areas where saw logs could still be harvested. The lumberman operating alone must have logs of certain size to meet competitive market conditions. The pulp manufacturer, on the other hand, is interested in total volume and can more or less disregard the question of size of the individual piece. A proper co-ordination of the two interests accordingly permits of a shorter rotation period than would be possible if lumber alone were the crop.

The whole subject of scientific management of forests in this country is still in its formative stage. There is much opportunity for resourceful research which should be participated in by the three research agencies at work. The private research work will naturally direct itself along the lines of purely local needs. The State research will work on the broader lines of a State wide program, while Federal forest research should co-ordinate the other two activities and should handle the questions of national scope.

Resumé

The final address of the conference was delivered by D. C. Everest, president American Paper and Pulp Association, Rothschild, Wis., who spoke on, "Meeting these Problems by Government and Industrial Research." Mr. Everest analyzed the entire problem of reforestation as principally one of research. American industry in other lines has answered this question through the expenditure of huge sums of money for research. Agriculture has shown tremendous results to be gained from research. Better seed, better grain, better stock, better yields, all have come through research financed by government or state agencies. The growing of a timber crop is equally as important as any or all agricultural projects.

The subject of forest management is one in which the National and State Governments are vitally interested. As owners of a very large portion of the timber area of the country and a constantly increasing amount of cut over lands reverting for tax, the Government should lead the way through the agencies established under the direction of the Forest Service. The perpetuation of the timber supply in the United States is the most important question confronting the public today. It involves the health, happiness and prosperity of every person in the country. It is classed as the fourth industry in the United States, but it must be remembered that no industry could carry on business except forest products were available.

In dealing with the subject of forest research, it is impossible to enter into detail as to specific performance in any industry, but in listening to the discussion one was impressed with the vast difference existing between the two principal branches of the wood using industries, the lumber industry and the pulp and paper industry. Both use certain species of forest products, but beyond that there is but little similarity in their operations. The pulp and paper industry is a highly developed technical industry in which every one engaged in the business is struggling for increased yields through new processes. It is a constant battle to reduce costs through better utilization. Industrial research has brought about much of the improvement in present practice. The Technical Association of the Paper Industry made up of nearly all the technical men in the industry, has been a powerful factor in the development of the business during the ten years of its existence. Research work is co-ordinated and greater progress has been made in the past ten years than in any previous twenty-five years. It is a plan that other industries might well follow.

The lumber industry, however, is not dependent on chemical processes for its existence. Quality of the timber stand is the governing factor in its output. It is claimed that there is little opportunity to change its product, but it was said during the meeting that through a long continued period of prosperity in other industries, lumber profits have constantly declined. Is it not possible that research might have produced for the lumberman the things which would have offset the effect of those materials which cut in on his business?

During recent years the staff of the Forest Products Laboratory has brought about a process for the modified chemical treatment of wood which may result in a complete change in the process of manufacturing pulp in some branches of the industry, and the yield increased from 40 to 50 per cent. Such developments are worth while and further and even more interesting developments are bound to come in the further studies of pulping wood.

The hope of the whole wood using industry lies in forest research, and through research more timber per acre will be produced, more value per unit secured than ever before. It is the building up of values which will make this forestry program possible.

Recommendations of the Conference

At the conclusion of the afternoon program, the committee which had been appointed to draft the conclusions and recommendations of the conference, was asked to report. The following recommendations were read and unanimously adopted, after which the conference was adjourned by presiding chairman, E. G. Griggs:

"This conference is convinced that it is fundamental to national welfare to produce a continuously ample supply of wood upon the 470,000,000 acres of land that will be idle if not kept in forest. The business of growing timber on one-fourth of the nation's land area is on a par with agriculture as the foundation of American economic and social structure.

"We are glad to report that despite adverse conditions, unparalleled in any other progressive country, an amazing advance in forestry has been made in the United States within the last 25 years and especially within the last 10 years. A majority of the owners of extensive forest lands of the West, a large percentage of those of the South and many other regions maintain ownership of their cut-over lands, and protect them from fire despite heavy taxes. This is an essential part of reforestation. We find, moreover, that some 200 corporations owning an aggregate area of 21,000,000 areas—nearly equal to the whole of the forests of France—have reported the adoption of forest management policies. But from all sides come reports of a discouraging struggle against conditions, which can be rectified only by public co-operation, through full recognition of individual and collective public responsibility.

To continue reforestation, to expand it to meet national and community requirements, the following measures are necessary:

1—Adequate public protection against forest fires.
2—Equitable and stable taxation.
3—Full technical and economic information through research.
4—Complete recognition by the people of state and federal responsibility.

Forest owners recognize the national necessity of continuous productivity of their lands when economically feasible. The growing of trees must be upon a business basis or it cannot be pursued. It is evident from the start already made that enlightened public policy will stimulate the general adoption of reforestation to maintain continuous production of wood on the nation's forest lands.

We recommend:

That the Clarke-McNary national forestry act be effectuated by immediate provision by Congress of the full amount of the annual appropriations if authorized, thus extending systematic fire protection and its other benefits throughout the country.

That our land taxation systems be thoroughly investigated and equitably revised to the end that local public revenues shall be protected; and, at the same time, the vital public economic interest of thousands of communities in the continued productivity of vast acres of land shall be safeguarded.

That comprehensive forestry research shall be authorized and vigorously supported by Congress, so that reforestation and wood utilization may be more intelligently directed.

That state and federal forest agencies whose co-operation we appreciatively recognize, shall have their hands strengthened. That recognizing their responsibility, forest land owners, assume, as a civic duty, the leadership in this great national business enterprise, already well begun.

Wonderful Exhibits at Power Show

Wide Range of New Mechanisms Exhibited at Sixth National Exposition of Power and Mechanical Engineering in New York

THE New York Power Show, or National Exposition of Power and Mechanical Engineering, as it is officially called, was opened in the Grand Central Palace, Lexington Avenue and 46th Street, New York, at 2 o'clock on Monday afternoon, December 5, with a display of machinery and processes that occupied four floors of this extensive building, and which will last a week.

The exhibits ranged from machinery of colossal size to tine sensitive precision instruments smaller than a thimble, and were of extraordinary interest not only to plant engineers but to manufacturers utilizing power in any form, there being shown new processes for heating, cooling, clarifying, cleansing, indicating and recording, controlling, etc. Modern centrifugal and other form of pumps, new insulation compositions, new styles of valves, new metals put to heretofore unthought-of uses, thermostats, vacuum traps, skid hoists, road building machinery, coal pulverizers, Diesel oil-burning engines, adamant guns for applying furnace linings, giant stokers, huge turbines, mercury vapor lighting and artificial sunlight represent only a few of the things which engineering and manufacturing executives in all lines of industry and even the general public found of interest and value.

Such interesting new things as a torque amplifier for automobile steering mechanisms, which utilizes power from the motor to assist in backing or turning a car when parking and so relieves the driver of the usual physical strain, appealed to many visitors. This was one of the interesting new devices exhibited by the Bethlehem Steel Company.

The new developments of upwards of half a thousand exhibitors were massed in the Grand Central Palace for technical and production staffs to study, forming an outstanding exhibit of transmission equipment, material handling and mechanical devices capable of being utilized in the complete equipment of any industrial plant.

The enormous strides made during the past few years in generating and using power are well exemplified in the present exposition which is the sixth of the series. The number of exhibitors shows a considerable increase over last year, the products of 530 different firms being on display.

In the subjoined notes of exhibits attention has been concentrated on products of firms that have more or less direct relations with pulp and paper mills and we would suggest that these notes be preserved for possible future reference.

Air Preheater Corporation, New York, N. Y.—Exhibits were made of a complete boiler plant equipped with the Ljungstrom Air Preheater and an animated picture of the preheater in operation, besides numerous photographs of boiler plant installations. Reprints of an article in the November issue of THE PAPER INDUSTRY describing the power plant of the Chesapeake Corporation, West Point, Va., were distributed.

Alexander Bros., Philadelphia, Pa.—A Tentacular transmission belt was shown in actual operation at this booth.

Allen-Sherman-Hoff Company, Philadelphia, Pa.—Displays were made by means of pictures of the method of operation of Hydrojet System, a section through a pulverized fuel fired furnace being shown in one picture with the Hydrojet System moving the ashes away. A second picture showed the ashes entering a sump, and being pumped into a storage bunker. The entire operation of loading trucks was shown.

Allis-Chalmers Manufacturing Company, Milwaukee, Wis.—Exhibited power machinery, hydraulic turbines, pumping engines and Texrope drives.

American Abrasive Metals Company, New York, N. Y.—Displayed Feralun, Bronzalun and Alumalun anti-slip walkway surface materials for safety stair treads and platforms, floor plates and elevator thresholds, descriptive literature being distributed.

American Brass Company, Waterbury, Conn.—Included among the exhibits of this firm were condenser tubes of both Admirality and Muntz metal, turbine blading of various metals, copper bus bars and tubes, as well as insulated and weatherproof wire and transmission cable, paper or varnished cambric insulated.

American Engineering Company, Philadelphia, Pa.—Featured underfeed stokers, boiler furnaces, coal and ash hoppers, together with hoisting engines, windlasses, steering machines and towing machines.

American Machine & Foundry Company, Brooklyn, N. Y.—Made an interesting display of different types of automatic weighing machines, including scales adapted for both free-flowing and non-free flowing materials. The latest developments in engines formed a part of the exhibit, there being shown Bronander, Diesel and gas engines.

American Pipe Bending Machine Company, Boston, Mass.—Exhibited and demonstrated different types of pipe bending machines, both power and hand operated.

American Pulley Company, Philadelphia, Pa.—Had attendants on hand to explain its line of pulleys, shaft hangers, hand trucks and hand car wheels, as well as pressed steel shapes and sheet metal stampings.

American Schaeffer & Budenberg Corporation, Brooklyn, N. Y.—Made an interesting display of recording and indicating apparatus, including instruments for controlling temperatures, pressures and speeds; pressure gauges, steam traps,

tachometers, electric temperature controller and various pop safety and relief valves.

American Water Softener Company, Philadelphia, Pa.—Illustrations consisting of wash drawings and photographs were used to show graphically types of continuous water softeners and literature was provided containing descriptions of their operation. Photographs of installations were also exhibited.

American Well Works, Aurora, Ill.—Showed a working model of an enclosed self-lubricating deep well power pump head in operation, and various types of centrifugal pumps were shown, capable of handling heavy liquids.

Arca Regulators, Inc., New York, N. Y.—This firm manufactures specialized controls for high and low pressures, temperature, humidity, density, speed, combustion and level, and apparatus was displayed to show construction and closeness of regulation.

Atkins, E. C., & Co., Indianapolis, Ind.—Metal cutting machines as well as saws and other tools were exhibited by this firm, demonstrations being also given of Atkins silver-steel, hand and power, high speed hacksaw blades.

Atlas Valve Company, Newark, N. J.—Showed a number of well-known appliances, including the Campbell boiler feed water regulator, damper and temperature regulators, pump governors, float valves, thermostats and balance valves.

Babcock & Wilcox Mfg. Company, New York, N. Y.—One of the interesting features of this exhibit was a B. & W. mechanical atomizing oil burner fitted with B. & W. No. 80 high-grade furnace brick. The exhibit also included sections of forged steel headers, superheater boxes, high-pressure gauge glasses and other fittings, besides Enduro and Toncan iron superheaters and economizer tubes.

Badger, E. B., & Sons Company, Boston, Mass.—Expansion joints of the Badger self-equalizing type were shown in both flanged and welding forms, also fitted with monel metal sleeves for superheat.

Bailey Meter Company, Cleveland, Ohio.—Showed a complete line of Bailey boiler meters, pressure and temperature recorders, tachometers and multi-pointer gauges, besides a number of different styles and sizes of meter panel boards. A practical demonstration was given of the operation of Bailey meter control as used for regulating the supply of fuel and air to the boilers in a power plant.

Bartlett-Hayward Company, Baltimore, Md.—Exhibited sectionalized models of Fast's flexible couplings, with photographs and drawings.

Bayer Company, St. Louis, Mo.—Exhibited models of Bayer mechanical soot blowers, as well as developments in high temperature blower elements.

R. H. Beaumont Company, Philadelphia, Pa.—A working model of the Beaumont super-central system of coal and ash handling was exhibited, skip hoist, tram car, suspension bunker, weigh larry, ash gates and cable drag scraper being displayed.

H. Belfield Company, Philadelphia, Pa.—Showed a variety of expansion joints and brass fittings, together with electric bronze valves, swing joints and water gauges and gland packed all-iron cocks.

Bethlehem Steel Company, Bethlehem, Pa.—A full size No. 2 Bethlehem pulverizer was exhibited in operation at this booth, as well as demonstration models of Bethlehem backlash eliminator and torque amplifier. Some power plant auxiliaries were also shown; these included the Bethlehem Dahl oil-burning system.

Bigelow Company, New Haven, Conn.—Featured in this exhibit was the Bigelow-Hornsby boiler, drawings and pictures of which were shown with and without integral steel economizer, and also with a combination slag screen and water-cooled bridge wall. A working model of the boiler attracted considerable attention.

Blaw-Knox Company, Pittsburgh, Pa.—In addition to the Blaw-Knox continuous regenerative air heater, models of clamshell buckets and other power plant equipment were exhibited in the booth of the Blaw-Knox Company, a firm which is well and favorably known in the pulp and paper industry as producers of forge and hammer welded digesters.

Botfield Refractories Company, Philadelphia, Pa.—Attracted the attention of many visitors by a working exhibit of the new Adamant gun for applying furnace linings composed of Adamant fire brick cement and Adachrome.

S. F. Bowser & Co., Fort Wayne, Ind.—Filtration equipment for turbines and other prime movers were displayed in this booth, Bowser Type B No. 1 filter being featured, as well as Bowser Model "W" grease lubricator and Xacto meter for fuel oil lines to burners.

Bristol Company, Waterbury, Conn.—The usual complete line of recording and indicating recorders, pressure and vacuum gauges were exhibited by the Bristol Company. In addition to recording tachometers, pyrometers and liquid level gauges, one could inspect recording thermometers for feed water economizers and flue gas temperatures.

Brown Instrument Company, Philadelphia, Pa.—Some giant reproductions of the Brown electric flowmeters were on exhibition at this booth, besides a model of the circular-chart type of flowmeters in mechanical operation. Other models capable of being actuated by visitors were exhibited, in addition to a full line of Brown power plant efficiency instruments.

Buffalo Forge Company, Buffalo, N. Y.—On exhibition at this booth were a number of fans, blowers, exhausters and coolers. A Buffalo No. O Universal iron worker, one of the popular maintenance tools, was also exhibited.

Buffalo Steam Pump Company, New York, N. Y.—Exhibited a new ball-bearing pump, known as class "S"; a Buffalo non-clogging sewage pump, and similar equipment.

Builders Iron Foundry, Providence, R. I.—A new shunt steam meter designed to measure the flow of steam in small pipe lines attracted special attention at this booth where was also displayed the well-known Venturi meter for measuring boiler feed supply and steam.

A. M. Byers Company, Pittsburgh, Pa.—Illustrated in their exhibit the process of manufacturing Byers Pipe, and specimens were on display showing the Spiral Stripe marking and method of rolling the name and year in each length; Vanstoned and welded joints and coils were also exhibited.

A. S. Cameron Steam Pump Works, New York, N. Y.—The general line of condensers and pumping equipment with which the Cameron and Ingersoll-Rand names are associated were shown, special interest being taken in the line of Cameron direct acting and centrifugal pumps.

Carborundum Company, Niagara Falls, N. Y.—An exhibit of super-refractories and high temperature cements constituted a display of some applications of Carborundum to boiler settings, including air-cooled walls, refractory protected water tube walls and solid walls.

Carrier Engineering Corporation, Newark, N. J.—Exhibited a new model of Carrier centrifugal refrigeration unit and air-conditioning apparatus for industrial plants, besides a gas heating and air-conditioning unit for the home, and a Gordon drier.

Celite Products Company, Los Angeles, Cal.—The application of Sil-o-cell insulation to boiler systems was demonstrated in the space occupied by the Celite Products Company. A number of charts and curves were on display to show relative conductivities of common structural materials.

Chapman Valve Mfg. Company, Indian Orchard, Mass.—Besides a working model of the Chapman motor unit showing the latest developments in that type, there was exhibited Chapman chrome nickel steel gate valves for high pressure, high temperature service, as well as a line of standard bronze and iron gate valves.

Chicago Chemical Company, Chicago, Ill.—Made an exhibit of sodium aluminate which is said to be an efficient coagulant in the clarification of trade wastes and sewage and for treating boiler feed water.

Chicago Pump Company, Chicago, Ill.—Had on view a gen-

eral line of pumps, including a new condensation vacuum pump, in addition to centrifugal pumps which find use in the pulp and paper industry.

Cochrane Corporation, Philadelphia, Pa.—Made an interesting exhibit of the Cochrane products, including strainless conical filters with single control and constant flow valves; Cochrane hot process water softeners; Cochrane chemical proportioner and feeder, traps, drainers and flowmeters.

Combustion Engineering Corporation, New York, N. Y.—An effective display of pulverized coal equipment, air preheaters, stokers and water-cooled furnace walls was made by means of panels and concealed projectors. All of the power plants in the United States and Canada containing boilers of 500 h. p. and over, burning pulverized fuel with storage equipment were shown on panels, check marks indicating Lopulco equipment in these stations. Other panels showing plant layouts and motion pictures were exhibited, in addition to enlarged photographs.

Cooper Hewitt Electric Company, Inc., Hoboken, N. J.—An operating exhibit of mercury-vapor lighting as used in industrial plants attracted attention. There was also shown an operating exhibit of Cooper Hewitt Kon-nec-tors.

Crane Company, Chicago, Ill.—Exhibited a line of valves and fittings of steel, iron and bronze, some valves being exhibited that were adapted for pressures up to 900 lbs., trimmed with stainless steel. A large size high-pressure steel valve was shown in section.

Crosby Steam Gage & Valve Company, Boston, Mass.—Showed a new nozzle type safety valve for pressure up to 1,500 lbs. per sq. in., besides a reseating tool which permits the reseating of safety valves in position on the boiler; also steam gauges and a gauge board.

Cutler-Hammer Manufacturing Company, Milwaukee, Wis.—A number of modern applications of electrical control apparatus was exhibited at this booth, particularly the 101 C-H Valve Control, and an "Across-the-Line" "X" automatic starter for alternating current motors. Electric space heaters and electrical tubular unit heaters were also on display, making an interesting and valuable exhibit.

Davidson, M. T., Company, New York, N. Y.—Models and actual pumps representative of the "Davidson" line of direct acting steam pumps of the simplex type were exhibited and demonstrated by the representatives of the company at this booth.

Davis, G. M., Regulator Company, Chicago, Ill.—Showed a varied line of pressure regulators of the piston and diaphragm type, stop and check valves and back pressure and relief valves.

De Bothezat Impeller Company, New York, N. Y.—The disk fan of Dr. G. De Bothezat which makes it possible to obtain high static pressure with great efficiency was exhibited here in various designs and types, a practical demonstration of the De Bothezat disk pressure fan being given.

De Laval Separator Company, New York, N. Y.—The exhibit at this booth consisted of centrifugal purifiers for removing water and solid matter from oils and various other purposes, some of which are beginning to be utilized profitably in pulp mills.

De Laval Steam Turbine Company, Trenton, N. J.—The feature of this exhibit was a centrifugal pump designed for feeding modern high-pressure boilers. A steam turbine of the velocity stage type was also exhibited, as well as compressors for air or other gases and various types of worm reduction gears and flexible couplings.

d'Este, Julian, Company, Boston, Mass.—Steam pressure regulators of Curtis improved type featured the exhibit at the booth of Julian d'Este Company, there being pressure reducing valves for steam and hydraulic operation; steam traps; temperature regulators for hot water tanks and float valves for hot and cold water.

Diamond Power Specialty Corporation, Detroit, Mich.—Exhibited samples of Diamond hand and electrically operated soot blowers for the removal of soot deposits from the heating surfaces of steam boilers.

Dixon, Jos., Crucible Company, Jersey City, N. J.—Dixon's graphite products for various purposes in every line of industry were shown. These included flake graphite, graphite greases, silica-graphite paint and belt dressing. Descriptive literature pertaining to these products was handed out.

Dodge Manufacturing Company, Mishawaka, Ind.—Exhibited transmission equipment, including shaft hangers, split pulley and bearings, as well as oil engines, conveyors and special machinery.

Edge Moor Iron Company, Edge Moor, Del.—The principal exhibit made by Edge Moor Iron Company was a full-size hammer-welded boiler drum designed for high pressure service and for single-pass boiler for the Oklahoma Gas and Electric Company at Harrah, Okla. Descriptions, drawings and photographs of the type of boilers made by Edge Moor Iron Company were available.

Engineer Company, New York, N. Y.—Enco equipment was featured in this exhibit, there being models or actual parts to show Enco combustion control; Enco burners; Enco baffle walls and Enco cross baffles. A new combined oil and gas burner was shown.

Erie City Iron Works, Erie, Pa.—This exhibit featured some contributions of the Erie City Iron Works to the development of power plant and pulverized fuel apparatus. In addition to the Seymour basket type of water-cooled furnace a model was also exhibited of the Erie City 3-drum inclined water tube boiler with integral economizer. The construction of the Unitype pulverizer was also shown.

Ernst & Co., Newark, N. J.—Showed water columns with inclined gauge glass, and distributed literature descriptive of its line of liquid level gauges and gauge glass guards.

Fafnir Bearing Company, New Britain, Conn.—Ball-bearing power transmission equipment of various types was exhibited as well as a line of single row radial, double row, thrust bearings and hanger boxes, pillow box and loose pulleys.

Fairbanks, Morse, & Co., Chicago, Ill.—In addition to ball-bearing centrifugal pumps and motors a Diesel engine generating set was exhibited, besides various other alternating and direct current motors.

Farnsworth Company, Conshohocken, Pa.—Exhibited a newly developed drainage receiver that meters high temperature liquids besides recording the temperature and indicating the exact time the high temperature water is received.

Fisher Governor Company, Marshalltown, Iowa.—Showed pump governors and exhibited working models of automatic specialties for the control of steam, air, gas, water and oil.

Flexible Steel Lacing Company, Chicago, Ill.—Some of the specialties exhibited by this company included alligator steel belt lacing, Flexco H. U. belt fasteners and Flexco and Flexco-Lok guards for electric lamps.

Flynn & Enrich Company, Baltimore, Md.—Huber mechanical stokers were exhibited, one being shown in action to illustrate the method of coal feed to the furnace of the boiler and the control of the fuel bed.

Foote Bros. Gear & Machine Company, Chicago, Ill.—A complete line of spur, worm and herringbone gear speed reduction units featured this display and flexible couplings were also exhibited.

Foster Engineering Company, Newark, N. J.—Exhibited different types of pressure regulators and pump governors as well as automatic valves. Equipment for high boiler pressure and temperatures, consisting of drop-forged, cast steel, chrome constructions, was seen in practical operation.

Foster-Wheeler Corporation, New York, N. Y.—A large Aero Unit coal pulverizer ready for operation was on exhibition here, and full-size sections of the Foster sectional air heater, in addition to drawings and photographs of condensers, pumps, cooling towers, evaporators and feed water heaters.

The Foundation Company, New York, N. Y.—A pictorial representation of steam and hydro-electric power house construction formed the background of this booth. This showed the extent of the company's operation.

Foxboro Company, Inc., Foxboro, Mass.—The well-known line of indicating and recording instruments manufactured by Foxboro Company formed an interesting display. Besides standard power plant instruments there were recording thermometers and pressure gauges, draft gauges, tachometers, and flue gas recorders.

Frederick Engineering Company, Frederick, Md.—Showed details of steam jets, ash handling systems, and elevated bins.

Frederick Iron & Steel Company, Frederick, Md.—Showed several types of centrifugal pumps and their manner of operation. A working model of a coal tipple, equipped with the Frederick revolving roll coal separator was also exhibited.

Fuller-Lehigh Company, Fullerton, Pa.—A model was shown of the Calumet burner and a section of Bailey water-cooled furnace wall, there being also a drawing of installations made by the company.

Furnace Engineering Company, New York, N. Y.—Exhibited a Simplex unit pulverizer equipped with independent motor-driven feeder and magnetic separator. Interest was added to the exhibit by the operation of an animated picture showing the workings of the system as well as photographs of installations.

Ganschow, Wm., & Co., Chicago, Ill.—Exhibited several types of speed transformers and worm-gear speed reducers. Featured in the exhibit were three types of Planetary spur gear speed transformers as well as a number of industrial gears.

General Electric Company, Schenectady, N. Y.—The G. E. atomic-hydrogen welding equipment attracted special attention as demonstrating the welding of various alloys and non-ferrous metals. Included in the exhibit were a centrifugal air compressor and a small turbine battery charging equipment.

Gillis & Geoghegan, New York, N. Y.—Exhibited the operation of a G. & G. ash removal equipment by electric and hand power models which attracted much attention.

Girtanner Engineering Corporation, New York, N. Y.—Had a working model of modern ash removal and conveying equipment, including steam jet, hydraulic, steam and fan vacuum and water sluicing systems.

Green Fuel Economizer Company, Beacon, N. Y.—Of special interest in this booth was a working model of a new device known as Cindertrap which is intended to solve the cinder problem in large boiler plants. Tubular and plate-type air preheaters were also shown.

Grinnell Company, Providence, R. I.—The Grinnell line of Triple XXX pipe joints featured the display at this booth, with test pieces exhibited showing coupling, weld, butt-weld, and lap joints complete, also Grinnell adjustable pipe hangers and supports.

Griscom-Russell Company, New York, N. Y.—Visitors to this booth were interested in the line of coolers, evaporators, and water heaters manufactured by the company. Literature was supplied on the U-fin air cooler, air preheater and deaerators.

Hagan Corporation, Pittsburgh, Pa.—Pulp and paper mill engineers found much to interest them in the exhibit of the Hagan Corporation. In addition to steam purifiers a working exhibit of the Hagan centralized boiler control system was shown.

Hardinge Company, Inc., New York, N. Y.—In addition to clarifiers used in pulp mill work the Hardinge Company manufactures coal pulverizers and a small working model of the Unit pulverizer was shown in operation. The control of fuel to the burner is instantaneous and the maintenance of fineness is constant at all capacities or ratings.

Huyette, Paul B., Company, Philadelphia, Pa.—Exhibited various recording apparatus, including an open model of Hays CO_2 recorder, motor driven; and a boiler panel, with flowmeter, draft recorder, pyrometer high and low water alarm and pressure gauge.

Hyatt Roller Bearing Company, Newark, N. J.—Roller bearings for all kinds of transmission equipment were on exhibition here, some being of special interest, as the high-duty type Hyatt for use where restricted space, high speeds and extreme accuracy are requirements. The Hyatt line shaft bearing, made to fit all standard hangers is said to be a great power economizer and easy to install.

Ingersoll-Rand Company, New York, N. Y.—Occupied the same booth with the A. S. Cameron Steam Pump Works and distributed literature concerning the general line of air compressors, condensers and pumps.

International Nickel Company, New York, N. Y.—A number of manufactured parts formed of monel metal and nickel metals were displayed at this booth, some of which were loaned or donated for this purpose by their respective manufacturers.

Jenkins Brothers, New York, N. Y.—Exhibited a line of bronze and iron valves in both globe and gate type, besides mechanical rubber goods, including sheet packing, and Moncrieff Scotch gauge glasses.

Johns-Manville, Inc., New York, N. Y.—Displayed samples of asbestos products, including boards and paper.

Kellogg, M. W., Co., New York, N. Y.—Showed samples of piping material for high-pressure steam plant service, also Dean high pressure power operated swing gate and slide gate valves.

Kennedy-Van Saun Manufacturing & Engineering Company, New York, N. Y.—The Kennedy pulverized coal equipment operating a steam boiler was shown as an animated picture. The system is known as the Kennedy Airswept Tube Mill system of pulverizing and burning coal.

Keystone Lubricating Company, Philadelphia, Pa.—A practical demonstration was given of the several systems of using the Keystone Safety Lubricator. Keystone liquid greases and a variety of other Keystone lubricants were displayed.

Keystone Refractories Company, New York, N. Y.—A bonding agent for the coating of fire bricks known as Dura-Stix was featured at this booth, as well as Steel Veneer surface coating and the Keystone sprayer.

Kilsoot Chemical Company, Inc., New York, N. Y.—Packages of this soot destroyer and carbon remover were exhibited, together with descriptive literature.

LaMont Corporation, New York, N. Y.—Drawings, pictures and prints of LaMont steam generators and the LaMont duplex steam flow valve were exhibited in addition to drawings and photos descriptive of the LaMont water wall screen as used with H. R. T. boilers.

Leeds & Northrup Company, Philadelphia, Pa.—Made a show of electric CO_2 recorders and gave a complete working demonstration of L. & N. automatic combustion control for boiler furnaces. Some delicate scientific apparatus was also on display including hydrogen-ion recorders, frequency meters, pyrometers and thermometers.

Lincoln Electric Company, Cleveland, Ohio—Made an interesting exhibit of the "Linc-Weld" motor and "Stable-Arc" welder, the actual operation of welding being shown. A feature of this exhibit was a Linc-Weld motor operating under water in a glass tank.

Linde Air Products Company, New York, N. Y.—Exhibited welding apparatus and supplies, including Linde oxygen, Prest-O-Lite dissolved acetylene and examples of welded construction.

Link-Belt Company, Chicago, Ill.—Featured the Sykes herringbone speed reducer and a new Link-Belt anti-friction belt conveyor idler, Caldwell speed reducers and the Link-Belt silent chain.

Locke Regulator Company, Salem, Mass.—Made a display of damper regulators, balanced valves, pump governors, reducing valves, hydraulic regulators and exhaust relief valves.

Lunkenheimer Company, Cincinnati, Ohio—Attracted attention with an interesting group of valves of bronze, steel, and monel metal.

Manning, Maxwell & Moore, Inc., New York, N. Y.—Displayed Ashcroft gauges and specialties, such as Ashcroft

power control valves, Hancock valves and Consolidated safety valves of various designs.

Mason Regulator Company, Boston, Mass.—Showed a number of reducing pressure valves, pump governors, damper regulators, float valves and strainers and there was a working model of No. 132 fan engine regulator and draft control.

Merrick Scale Manufacturing Company, Passaic, N. J.—The Merrick conveyor weightometer was seen in operation weighing coal, and the Merrick mechanical weighman operating on weigh tanks, while the Merrick addoweight was exhibited; this is a totalizing dial scale for weighing buckets on an overhead track system while in motion.

Mixing Equipment Company, New York, N. Y.—Electrically operated stirrers and mixers adaptable to all kinds of containers and capable of being set at any angle were seen in operation at this booth.

Moore Steam Turbine Corporation, Wellsville, N. Y.—Exhibited a combined turbine and reduction gear of new design and other power plant equipment, including a complete turbine driven boiler feed pump and a pinion of a 1,500 hp. three-bearing reduction gear.

Morse Chain Company, Ithaca, N. Y.—An interesting method of describing the operation of Morse chains was used in this booth. A highly finished chain was seen running on two sprockets with a handle for propelling it. The washers were removed from one side of the link so that the action of the Morse rocker joint might be clearly seen. By slowly turning the handle the rocking action of the pins in running from the sprockets was clearly illustrated. The flat bearing surface between the pins while the chain is between the sprockets was also seen.

Nash Engineering Company, South Norwalk, Conn.—The usual impressive exhibit was made by the Nash Engineering Company in which the Jennings-Hytor pumps and sewage ejectors were shown, besides gas compressors, air compressors and condensation return systems.

National Lead Company, New York, N. Y.—Exhibited literature and samples of Babbitt metal, expansion bolts, red lead, white lead, lead pipe, lead washers, lead sheets and other kinds of lead that find use in pulp and paper mill work.

Niles Gear Company, New York, N. Y.—Showed samples of various types of gears, including the Maag helical, herringbone and straight spur hardened and ground gear for heavy duty and high-speed conditions.

Norma-Hoffman Bearings Corporation, Stamford, Conn.—A complete line of ball, roller and thrust bearings were on exhibit at this booth. Sectioned motors, reduction gears and other mechanisms were used to illustrate the operation of the bearings. The Hirth minimeter, a precision measuring instrument, was also displayed.

Northern Equipment Company, Erie, Pa.—Had an interesting display of the Copes feed-water regulator in both the standard design and Type R for high pressures; the Copes pump governor and control valve were also exhibited.

Oakite Products, Inc., New York, N. Y.—The uses of Oakite in various industries were shown by a series of charts, blue prints and illustrations, and a booklet giving details concerning the important uses of Oakite in cleaning operations in and about power plants was distributed.

Pennsylvania Crusher Company, Philadelphia, Pa.—Showed working models of Bradford coal breaker and Armoframe coal crushers and distributed literature pertaining to the general line of crushing machinery.

Permutit Company, New York, N. Y.—Water softening and filtering processes were demonstrated in this booth by means of a model Permutit equipment about four feet long and made exactly to scale after the design of a large commercial unit that delivers 100,000 gallons a day. This attracted a great deal of attention. Ranerax CO_2 recorders also formed part of the exhibit, which was a most attractive one to plant engineers.

Philadelphia Gear Works, Philadelphia, Pa.—Exhibited a complete line of industrial gears and pinions and speed reducing units.

Poole Engineering & Machine Company, Baltimore, Md.—Showed specimens of gears and speed reducing units, featuring the Poole flexible gear type coupling.

Prat-Daniel Corporation, New York, N. Y.—Showed an adjustable soot blower for plate-type heaters, also stream-line stack for high draft. Photographs of installations were shown and catalogues given out.

Pyrometer Instrument Company, New York, N. Y.—Exhibited the radiation pyrometer and other "Pyro" instruments, including the new Pyro tachometer.

Quigley Furnace Specialties Company, New York, N. Y.—Featured Hytempite, a plastic high temperature cement that is used for furnace and boiler settings and repairs. The Quigley refractory gun for shooting the mixture at any place in wall or arch was also shown.

Ramsey Chain Company, Inc., Albany, N. Y.—Displayed Ramsey sprockets, pinions and chains. Nine chains suspended on sprockets were shown operating at 1,500 rpm.; another with a 1″ pitch x 12″ wide chain, freely suspended from a sprocket, ran at 3,100 rpm.

Reading Steel Casting Company, Inc., Bridgeport, Conn.—Displayed an 18″ iron body bronze gate valve equipped with motor control, also cast steel gate valves with rustless steel trim and 12″ series 40 cast steel flanged tee.

Richardson Scale Company, Clifton, N. J.—The importance of weighing coal consumed by each boiler individually was emphasized at this booth where a full size Richardson apron-feed automatic crushed coal scale was exhibited. This is used for weighing direct from overhead bunker to hopper of automatic stoker or pulverizer.

Riley Stoker Company, Worcester, Mass.—A display of remarkable interest, consisting of the greatest Riley Stoker ever developed, a super-stoker 11′ 3″ long, was made in this booth. In addition there were exhibited an improved Riley Atrita unit pulverizer, a Riley Flare Type burner and a new Jones stoker unit. Among the literature given out was a reprint of an article from THE PAPER INDUSTRY descriptive of the Fitchburg Paper Company's boiler plant.

Ruths Accumulator Company, New York, N. Y.—The Ruths system of steam storage was set forth by means of photographs and diagrams together with a display of various accessories used in connection with the Ruths accumulator, these including steam governors and controls.

SKF Industries, Inc., New York, N. Y.—The well known SKF ball bearings were exhibited in various applications and the advantages of such anti-friction bearings were portrayed visually by several novel devices.

Sarco Company, Inc., New York, N. Y.—Thermostatic steam traps, temperature regulators and strainers featured the exhibit of the Sarco Company. Among other apparatus displayed were standard and special temperature regulators for hot water service tanks and industrial processing, besides instruments required for low pressure vacuum and vapor heating systems.

Schutte & Koerting Company, Philadelphia, Pa.—Showed steam and water jets for pumping liquids and handling air and gases; spur and herringbone rotary gear pumps, Klinger piston valves, and the Helpbringer electric control for motor-operated reducing valves.

Sharples Specialty Company, Philadelphia, Pa.—Exhibited portable oil purifiers which are coming into use for various purposes in some pulp mills. A cross section model of the Sharples super-centrifuge was shown, a model being used to demonstrate the action of the machine.

Shays, J. R., Jr., Inc., New York, N. Y.—Exhibited a new process for reproducing tracings on tracing cloth which was of special interest to draftsmen. By this means tracings can be made from blueprints and line drawings on heavy paper.

Shepard Elec. Crane & Hoist Company, Montour Falls,

N. Y.—Made the usual interesting display of Shepard hoists, two being shown in operation, while the use of this equipment in pulp and paper mills and other industrial establishments was shown by means of photographs.

Smidth, F. L. Company, New York, N. Y.—Staff engineers were in attendance at this booth to explain the operation of the Lenox drive, a model of which was exhibited in action to show how the Lenox responds automatically to variations in the load applied to a driven pulley. Demonstrations were given by the stroboscopic method of the power lost through belt slippage.

Smoot Engineering Corporation, New York, N. Y.—Showed the Smoot centralized system of combustion control in operation, whereby regulated amounts of fuel and air are admitted to a gas-fired boiler. A uniform steam pressure and a constant percentage of CO_2 are maintained by the operation of Smoot Regulators and Smoot master controllers respectively.

Sturtevant, B. F., Company, Boston, Mass.—Working models were used to demonstrate the application of the various specialties controlled by the B. F. Sturtevant Company and there were always a number of interested visitors at this booth to see the operation of machines and tools for exhausting and supplying air for various industries.

Sunlike Illuminating Company, New York, N. Y.—The Sunlike lamps for providing daylight illumination were shown in various sizes and finishes.

Superheater Company, New York, N. Y.—Modern tendencies in steam power plants were exhibited at this booth by means of enlarged detailed layouts of boilers with Elesco superheaters for a number of prominent plants.

C. J. Tagliabue Manufacturing Company, Brooklyn, N. Y.—Exhibited steam and air operated controllers for temperature and pressure, besides recording thermometers and pressure and vacuum gauges. Mono duplex recorders for indicating and recording the percentage of CO and CO_2 in flue gases were also exhibited.

Taylor Instrument Companies, Rochester, N. Y.— A comprehensive display of industrial thermometers and self-acting and air-operated temperature controls for use in the power plant and industrial field was made of instruments bearing the trademark Tycos.

Terry Steam Turbine Company, Hartford, Conn.—Featured in their exhibit the rotor of a 500 kw. multi-pressure turbine and the Terry turbine stoker drive, together with Terry flexible shaft couplings.

Texas Company, The, New York, N. Y.—Had an attractive display of lubricants and lubricating oils with moving elements to show the circulation of oil.

Tide Water Oil Sales Corporation, New York, N. Y.—Had on view a line of Tycol industrial oils and greases and distributed literature.

Timken Roller Bearing Company, Canton, Ohio—Showed their line of bearings for industrial machinery including both single and double roll bearings for electric motors.

Toledo Scale Company, Toledo, Ohio.—Showed several models of Toledo automatic bench scales as well as portable and larger models of the types used in paper mill finishing rooms and elsewhere. The lever system for hopper scales used in measuring coal consumption was demonstrated.

Uehling Instrument Company, Paterson, N. J.—Featured the Apex CO_2 recorder and indicator as well as the Uehling combined barometer and vacuum recorder.

United States Testing Company, New York, N. Y.—Made their usual interesting display of testing systems, but featured the testing of coal for moisture, volatile matter, fixed carbon, ash and sulphur, as well as B. t. u.

Walworth Company, Boston, Mass.—Showed steel valves for high pressure, high temperature working conditions and a line of highest brass valves, sectioned and mounted on boards.

Webster, Warren & Co., Camden, N. J.—New developments and refinements in Webster systems of steam heating and equipment for steam pressures were exhibited and demonstrated at this booth.

Westinghouse Elec. & Mfg. Company, East Pittsburgh, Pa.—Exhibited a new turbine generator unit, 200 kw. geared and a 3 kw., 125-volt turbine generator unit, besides a 100 hp. mechanical drive turbine and one 4" priming ejector.

Wheeler, C. H., Manufacturing Company, Philadelphia, Pa.—Exhibited a sectional model of a two-stage radojet air pump, with inter- and after-condenser and other cross-sectional models of air pumps, as well as the Leach Fracto control condenser. Drawings and photographs of condenser installations and auxiliaries formed a notable part of the exhibit.

Wing, L. J., Manufacturing Company, New York, N. Y.—In this booth turbine blowers were exhibited that supply forced draft to stokered and hand-fired boilers, and there were also shown motor-driven forced draft boilers for burning small anthracites in low-pressure boilers; speed regulators for controlling the speed of motor-driven blowers and a Wing-Scruplex exhauster and fan.

T. B. Wood's Sons Company, Chambersburg, Pa.—The well-known line of power transmission appliances manufactured by T. B. Wood's Sons Company included flexible couplings, U. G. automatic belt contractors, ball-bearing transmission appliances and U. G. shaft hangers.

Worthington Pump & Machinery Corporation, New York, N. Y.—In addition to pumps and pumping outfits, including multistage hydraulically balanced boiler-feed pump of the volute type for high pressures, this company exhibited the Axiflo sump pump and vertical and horizontal single-stage compressors.

Yale & Towne Manufacturing Company, Stamford, Conn.—Featured electric industrial high and low-lift trucks from two to five-ton capacity, also tractors and trailers. A display was also made of chain hoists and cranes.

Yarnall-Waring Company, Chestnut Hill, Philadelphia, Pa.—An impressive display was made of Yarway blow-off valves at this booth, which also had a working model of a Yarway spray pond equipped with Yarway involute spray nozzles and fittings. Other Yarway products shown included hydraulic valves and pipe clamps.

New Alloy Valuable Discovery

A new alloy, said to be three times as strong as iron and as light as aluminum, was brought to this country recently by its inventor, Dr. Max Wurmbach, professor of metallurgy at the University of Munich.

The alloy, "neonaleum," Dr. Wurmbach says, is the most important discovery of the kind since the invention of duralumin in 1907. A piano made of neonaleum, he said, would be so light that it could be picked up and carried by a small boy.

Swenson Evaporator Elect President

Philip B. Sadtler, formerly vice-president of the Swenson Evaporator Co., a subsidiary of Whiting Corp., Harvey, Ill., has been elected president of that company to succeed the late Mr. N. S. Lawrence.

Mr. Sadtler has been with the Swenson organization for about twenty years, during which time he has handled a wide range of chemical engineering problems involving evaporation and heat transfer processes. He is a graduate of Massachusetts Institute of Technology and holds membership in various scientific societies.

The Import Paper Co., of Chicago announces that John R. Robinson has become associated with the company as general manager, effective November 17, 1927. Mr. Robinson formerly was sales manager of the Rex Paper Co., Kalamazoo, Mich., and prior to that was with the Butler Paper Corporation of Chicago for many years.

Wisconsin Valley Safety Conference

Paper Mills Head Safety Work in State

FOR the purpose of exchanging ideas and learning new methods to promote the health, happiness, peace of mind and contentment of the employees of the various industries of the Wisconsin river valley, nearly 400 safety engineers, employees and executives of fifty factories and manufacturing plants gathered in Wausau, Wis., Thursday, November 10, for the initial meeting of the Wisconsin Valley Safety Conference, which was sponsored by the National Safety Council with headquarters in Chicago.

The program for the morning sessions consisted of two separate meetings; one expressly for the paper and pulp section of the conference, and the other for representatives of all other trades. Well-known speakers addressed both meetings and those present at the gatherings were in unison in exclaiming that the valley conference was one of the most interesting ever held in the State.

Following the morning meetings, a joint session was held in the afternoon, when talks by safety engineers and a demonstration by a local first-aid team composed of girls gave the hundreds of exponents of safety first some interesting information. This gathering was followed by a banquet in the evening at which another safety program was held.

Paper and Pulp Section Meet

Undoubtedly the most important meeting held during the day's conference was the session of the paper and pulp section, when 200 accident preventionists from valley paper mills exchanged their views during the discussions that followed the interesting talks of the scheduled speakers. In attendance at this gathering were executives of paper mills, as well as safety engineers and other employees who joined with the one thought in mind, to decrease accidents that cause serious injuries which oftentimes result in deaths.

That the paper mills of Wisconsin are rapidly becoming the safest industrial plants in which to work, was brought out in the talks by the several speakers, among whom were mill executives, safety engineers, foremen and employees. From these talks, many ideas were carried home by the men where they can be practiced in their work of preventing accidents. Some of the talks were by men experienced in the various lines of the movement who have been studying safety problems since the inception of the safety wave over the United States.

Although Wisconsin is at the present time safer for the worker in the various plants and factories than in most states, especially in the paper mills, according to the speakers, the problems they were confronted with during the interesting and educational session will create a desire by those in attendance to make their work and that of their fellow employees more free from accidents and injuries.

Safety Education

F. H. Rosebush, of Port Edwards, Wis., regional director of the Paper and Pulp Section of the National Safety Council, was the chairman of the paper and pulp meeting. He summed up the accomplishments of the safety movement in this district and stated that the region over which he is director is one of the strongest sections of the National Safety Council in regard to the promotion of safety first methods. He said that a great deal of good work has been accomplished by the safety engineers of the paper industry through the education of employees in the mills and tributary factories.

Believing that the work of safety promotion could be farther advanced through education than by any other method, Mr. Rosebush urged the paper mill men to send any news item relating to accidents and their prevention methods to him for publication in the various paper mill bulletins and magazines, or directly to the editors of such mediums. He said the co-operation of the mill employees in this respect was one of the leading factors in making mill work safer.

Paper mill heads send their men to safety conferences to learn the best methods in preventing accidents and the first requisite to safer shops is for the safety men and foremen to be one hundred per cent on the job in checking up on employees who fail to regard the rules laid out for them, Otto Rachels, wood yard superintendent of the Northern Paper Mills Co., of Green Bay, said in his lengthy discussion of wood yard accidents. Safety engineers must first sell the idea to themselves before they can direct the work, Mr. Rachels declared, and after doing this the engineers must create a desire upon the part of other employees to strive for better working conditions around the plants.

Safety engineers must advise workers of the dangers at hand and they will in time become cautious, taking special care in keeping themselves and others from injuries. By preventing accidents, the happiness of the home is more complete and substantial, he asserted. Foremen of wood yards as well as any other part of the mill should follow a specific program for the promotion of safety. Wood piles in the yards should be kept in an orderly manner, and all unnecessary rubbish about the yards should be cleaned out of the way.

After Mr. Rachels concluded his talk, many questions were asked from the floor, which he answered to the satisfaction of those present, and the discussions that followed gave out many ideas on the prevention of accidents.

Safety Problems in the Pulp Mill

Safety problems of the wood room and of the sulphate mill were outlined by Len E. Smith, superintendent of the Nekoosa-Edwards Paper Co., of Port Edwards. Mr. Smith carried the listeners from the wood room to all other parts of the sulphate mill and explained to them where accidents often occur. Most of the accidents are caused through carelessness, he remarked, and he showed in his talk how many of them could have been avoided.

Watch Clothing

If men would dress more carefully while on their respective jobs, accidents would be less numerous, George McElroy of the Kimberly-Clark Co., of Neenah, said in his instructive address to the delegates. He asserted that most men are careless in donning working clothes when they relieve others from the various tasks, often leaving a shoe untied, shirt sleeves unfastened or garments not properly tucked in. These "odds and ends," he remarked, often catch into the machinery and cause the wearer unnecessary pain and sometimes an arm or a leg. The most dangerous place around a paper mill is in the machine room where the mammoth mechanical devices keep on moving regardless of the safety of the employees, Mr. McElroy stated, and not enough caution can be taken in these departments of the mills.

Men who are destined to work in paper mill machine rooms should be carefully selected by the employment agent with the idea of getting the right man for the job, according to the speaker, who said that after they are employed they should be put to work on crews with old and experienced men where they can be watched and prevented from doing the wrong things that may result in the serious injury of themselves and their co-workers. The machine room should be properly ventilated so that none of the acids and other odorous substances can cause illness.

Although there are guards placed around all dangerous pieces of machinery, the employee must be educated in the rules governing safety, and during the apprentice stages he must be told of the hazards that have at some time or other caused accidents. Before the employee can be sold on the idea of safety, he must be placed in that frame of mind so that he will practice safety methods and there should be no let-up on the part of the foreman or the safety engineer to see that the employee does the right thing at the right time, Mr. McElroy pointed out.

Paper Mills Lead in Safety

Paper mills of Wisconsin have the lowest rate of accidents of all the industries of the State, and Wisconsin has the lowest rate of accidents of all the neighboring states, R. G. Knutson of the Wisconsin Industrial Commission said before the paper mill men. He likewise paid a tribute to the other paper mills

of the United States when he said that during safety campaigns recently conducted, the paper industry was among those with the least accidents of all the companies affiliated with the National Safety Council.

In commending the paper mills of Wisconsin, Mr. Knutson stated that this industry leads the State in safety work and that no other industry can boast of as few accidents that appear in mills. He said that the paper mill employees cooperate with the State Industrial Commission as no other industry has, and that the State mills have done a great deal toward the goal set by the National Safety Council. Mr. Knutson declared that the best method of obtaining the greatest results in the prevention of accidents was to create a complete co-operation between the employees, foremen and executives. He stressed the practice of safety first aid to injured workers, stating that many serious illnesses, amputations and deaths result from minor cuts and scratches.

As a method of pointing out to the paper mill representatives that the safety movement in the State of Wisconsin has been increasing for the betterment of working conditions, the industrial commissioner asserted that the insurance rate of the State industries is much lower than in the neighboring states, where accidents are more numerous. He also said, in turn, that the rate of insurance on paper mills of the State are comparatively lower than in other industries of the State.

Mr. Knutson paid a glowing tribute to the laws of the State affecting the wage earner, and especially to the compensation law which he termed to be the best in all the union, both to the employee and employer.

Banquet Addressed by W. H. Cameron

"America leads in the promotion of the safety movement, and other nations have sent representatives here to ascertain the methods used, to be practiced by them for the preservation of the lives, health and happiness of wage earners." W. H. Cameron, managing director of the National Safety Council said in his address before the delegates in session following the separate meetings at a banquet held in the imposing Elks' club of the convention city. North America is twenty-five years ahead of all other nations in its education and promotion of safety methods, according to the safety director.

The National Safety Council, he declared, is the outgrowth of the first successful instructive safety conference, which was held in Milwaukee in 1912, and today the organization includes 8,000,000 people who are identified with 4,500 companies holding membership in the council. Meetings held throughout the United States today for the promotion of safety problems attract the largest crowds of any national organization, and because of the instructive programs held, accidents have become less frequent and will continue to do so as the years roll by, Mr. Cameron informed his hearers.

During the year 1926 there were more accidents than during the year 1911, when the movement was first realized, but this was due, Mr. Cameron remarked, to the heavy increase in population and the larger production of automobiles. Most of the 90,000 deaths caused by accidents in 1926 were due to automobile wrecks, he said, while the railroad companies have cut down their total number of accidents by sixty per cent. Mr. Cameron declared that the automobile has brought more unrest to the people of America than any other mechanical device, and that there has not been up to this time any solution to the problem of making the highways safe.

Industrial plants which strive to prevent accidents and prolong life are pursuing the best policy for the welfare of mankind, and with these problems in mind the heads of the various industries are doing all in their power to make working conditions safer and thereby doing their bit toward the promotion of the seed of contentment and happiness throughout the entire land, Mr. Cameron told the paper mill representatives and other delegates to the conference.

In the plans for the promotion of safety the companies have cleaned their plants, placed guards over all dangerous machinery, and have educated their employees to the merits of the safety movement, the speaker informed and said that there are more accidents in the home at the present time that there are on the streets or in the industrial plants.

Section Meeting

A joint meeting was held by the Paper and Pulp section and the "all trades" section at the large auditorium of the Central School in the afternoon, and during the session several talks and demonstrations were presented. An address of welcome to the city of Wausau was given by the city attorney and the superintendent of schools. Dr. M. D. Cottingham of Kohler, Wis., read a paper on "Health and Its Relation to Accident Prevention."

Fires

R. E. Vernor, manager of the fire prevention department of the Western Actuarial Bureau of Chicago, gave an interesting talk on the terrors of fires and the waste in lives and property caused over a period of years. This talk was followed by a moving picture, "The Red Carnival," which depicted losses caused by fires and the source of several others. Preceding the motion picture showing resuscitation, the girls' drill team of the Wisconsin Valley Electric Co., of Wausau, gave a practical demonstration of the prone method of resuscitation.

Under the direction of the National Safety Council and regional officers, Fred W. Braun of the safety department of the Employers' Mutual Liability Insurance Co., of Wausau, made all the arrangements for the initial valley safety conference. The resources of the Wausau Chamber of Commerce ably assisted him and his committee in mapping out the program.

Paper Mill Representatives Present

Twenty paper mills of the Wisconsin River valley district were represented at the conference by nearly 150 delegates while more than fifty persons interested directly or indirectly with the paper mills of Wausau and the outlying districts attended the meetings. The paper mills and names of the delegates at the conference were:

Consolidated Water Power and Paper Co., Wisconsin Rapids—Earl Akey, Leo J. Barrett, Warren Beadle, A. L. Beatz, E. E. Belter, George Cumberland, Otto Federwitz, Herman Hill, E. E. Lyon, J. E. Normington, Earl F. Otto, Nicholas Pavloski, J. J. Plzak, Alfred Rember, Leland Rocheleau, Martin Ryce, Fred Powers, F. C. Labrot, William Duffy and W. A. Dugan.

Dells Paper and Pulp Co., Eau Claire—E. O'Brien, W. R. Davis, Jr., Otto Johnson and Walter Strassman.

Falls Manufacturing Co., Oconto Falls—Robert Gehling, Charles Gustin and Herman A. Korth; **Fox River Paper Co.**, Appleton—James C. Borland and George B. Estey.

Grandfather Falls Paper Co., Tomahawk—Neil Benson and J. H. Sullivan; **Great Western Paper Co.**, Ladysmith—C. A. Swanson, T. Husom and H. J. Fish, Jr.

Holberg Paper and Fibre Co., Green Bay—R. Anderson, J. Basche, H. F. Bins, C. Brunette, E. Lenz, R. Robinson, W. Verhagen and C. J. Thomas.

Kimberly-Clark Co., Niagara—William Genrich, Leslie J. Hatton, Olaf Hildahl, D. S. Howard, D. H. Keck, Marcel Richard, G. F. Sorenson, T. E. Vaughter and H. J. Wells.

Marathon Paper Mills Co., Rothschild—Allen Abrams, R. M. Altman, Olaf Benson, Ray Cooper, Kingdon Cress, Theodore Deininger, August Doepke, Walter Drew, Carl Hansen, Frank Hildebrand, Henry Holt, S. Elvira Jacobson, R. H. Kelly, George Kowalshyk, Albert Krause, G. L. Morisette, Henry LaVake, Emil Noren, Joseph Priebe, Walter Priebe, Charles Schael, Charles Schoenfeld, Ben Senefsky, Fred Zimmerman, George Urban, Joseph Wiener and P. M. Wilson.

Nekoosa-Edwards Paper Co., Port Edwards—G. A. Anderson, Daro Buchanan, Frank Caldwell, F. R. Goddard, C. J. Johnson, J. A. Johnson, C. A. Jasperson, Ignatius Koller, C. Konash, H. V. Madden, W. J. McGrogan, E. G. McGraw, J. J. Mlsna, M. J. Mollen, F. H. Rosebush, L. E. Smith, George Tomske, John Walley, J. W. Youngchild and Nicholas Zdrokoski; **Northern Paper Mills**, Green Bay—Otto Rachels.

Rhinelander Paper Co., Rhinelander—Fred Bolner, F. Brissette, A. C. Brown, R. Jensen, Robert Kennedy, David McKay, John Moes, Lester Mudgette, George Nichols, Joseph O'Malley, G. Roller and A. Wold.

Stevens Point Pulp and Paper Co., Stevens Point—E. R. Purdy.

Thilmany Pulp and Paper Co., Kaukauna—W. F. Ashe; **Tomahawk Kraft Paper Co.**, Tomahawk—S. B. Bugge and Theodore Jacobson.

Union Bag and Paper Co., Kaukauna—Gerald Brenzel.

Wausau Paper Mills Co., Brokaw—John Cizek, Anton Loss, Frank Pagel, Paul Quade, Frank Scholl, Arthur Schugt, John Sharfinski, August Wentzel, Andrew Wier and F. L. Zellers; **Wausau Sulphate Fibre Co.**, Mosinee—E. J. Crotlean, Francis Dupuis, Ferdinand Garbrecht, C. M. Green, Patrick Redmond and Ray Swift; **Wisconsin River Paper and Pulp Co.**, Stevens Point—J. D. Babcock, E. A. Gyrion and R. J. Tuchscherer.

Foreign Trade Opportunities

The following foreign trade opportunities are issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce. Those interested are requested to communicate with the Bureau at its offices in Washington or New York or its branch offices in other cities, in every case mentioning the number of the inquiries referred to.

No. 27931—Pulp and paper mill machinery and accessories. Montreal, Canada. Agency desired.

No. 27863—Envelopes of glassine paper. Cagnas, Porto Rico. Purchase desired.

No. 27861—Newspapers, overissued, clean. Calcutta, India. Purchase and agency desired.

No. 27862—Sulphate paper, white. Havana, Cuba. Purchase desired.

No. 27900—Toilet and blotting paper. Sao Paulo, Brazil. Agency desired.

No. 27944—Kraft wrapping paper. Bombay, India. Agency desired.

No. 27864—Writing paper, fancy, and boxed papeteries. Sydney, Australia. Purchase desired.

No. 27917—Writing paper and envelopes. Havana, Cuba. Agency desired.

No. 27900—Soda ash and caustic soda. Sao Paulo, Brazil. Agency desired.

No. 27924—Rosin. Tegal, Java. Purchase desired.

No. 28002—Bond, cover and printing paper. Glasgow, Scotland. Agency desired.

No. 28049—Bond paper, medium and low priced, and flat writings, and envelopes. Fusan, Japan. Purchase desired.

No. 28001—Cardboard boxes, and paper. Havana, Cuba. Agency desired.

No. 28000—Overissue newspapers. Rangoon, India. Purchase desired.

No. 28003—Wall board with plaster core. Glasgow, Scotland. Agency desired.

No. 27962—Wrapping and writing paper. Seydisfjord, Iceland. Agency desired.

No. 28019—Stationery and wrapping paper. Alexandria, Egypt. Agency desired.

No. 28121—Corrugated paper boxes. Quebec, Canada. Purchase desired.

No. 28107—Cardboard box-making machinery. Sydney, Australia. Sole agency desired.

No. 28124—Paper of all kinds, especially printing and writing paper. Auckland, New Zealand. Agency desired.

No. 28161—Paraffin paper. Glasgow, Scotland. Purchase and agency desired.

No. 28112—Writing and ledger paper. Florence, Italy. Agency desired.

No. 28135—Soda ash and caustic soda. Montevideo, Uruguay. Agency and purchase desired.

No. 28192—Paper of all kinds. Bangkok, Siam. Purchase and agency desired.

No. 28196—Cardboard boxes for packing crushed oats. Progresso, Mexico. Purchase desired.

The All-Ohio Safety Congress

Pulp and Paper Mills Hold Sectional Meeting and Plan 1928 Regional Conference in Miami Valley

WITH an attendance of about 50, representing 17 Ohio paper and pulp mills, a safety conference of this industrial section was held in connection with the All-Ohio Safety Congress, November 9 and 10; and a Miami Valley regional conference of the Pulp and Paper Section, National Safety Council was tentatively planned. This group is to co-operate with the Department of Safety and Hygiene of the Industrial Commission of Ohio, the organization being the suggestion of Superintendent Thomas P. Kearns.

To promote harmonious relations with the National Safety Council, Kenneth L. Faist, of the Champion Coated Paper Co., and regional director for the section, was unanimously chosen as chairman of the new group. D. D.Thirkield, safety director of the Sorg-Oglesby-Smith Co., Middletown, was made permanent secretary. Harry E. Hiers, employment manager of the Ohio Boxboard Co., Rittman, O., was selected as vice-chairman.

This conference was one of ten sectional meetings held the second morning of the All-Ohio Congress. The attendance and enthusiasm presage rapid development. Plans were made for a safety conference early in 1928, probably in Hamilton, in the midst of the Miami mills, a one-day session especially for the men on the job in order to bring the message and service of the National Safety Council directly to the mills. It was voted also that the Ohio pulp and paper mills hold a contest during 1928 and that suitable prizes be given to the winners, with special attention to first-year accomplishments. Ernest Augustus, safety director of the Mead Pulp and Paper Co., Chillicothe, was appointed chairman of the contest committee. He proposed that the contest be carried on as closely as possible in connection with the Paper Industry Contest, using the rules of the National Section and borrowing all the machinery and enthusiasm of the national event. Tentative ideas of a possible contest with the Michigan region, about to be organized, were broached, and regional director C. E. Torrance of the Bryant Paper Co., Kalamazoo, Mich., may find himself with a battle on his hands.

The new group voted its appreciation of the support received from the State through Superintendent Kearns and his deputies in working up the attendance, and endorsed the plan of a national "No Accident Week" proposed at the general meeting. A resolution was adopted thanking Dr. Hugh P. Baker, of the American Paper and Pulp Ass'n., for his interest in organized safety, and asking that if possible the subject be given place on the annual program of the association. The new group especially favored the idea of a full-time field man giving expert counsel to individual mills, and steps were taken to have the Ohio mills foremost in this matter.

The program of the Columbus meeting, with D. D. Thirkield in the chair, consisted of two addresses, combining between them the full scope of safety in industry.

Guarding Paper Mill Machinery

Roland Jones, safety engineer of the Surety Co., Chicago, spoke on "The Part Standard Guarding Plays in Accident Prevention." He was followed by W. J. Peacock, chairman of the National Paper and Pulp Section, speaking on "The Other Seventy-five Per Cent," meaning the accidents which guarding cannot prevent.

Mr. Jones is known as an authority on designing guards for machinery, in which business he has been for 21 years. He divided the subject into two parts: First, why make standard guards? Second, what can be accomplished by guarding? He declared that there are many reasons why guards should conform to standards. Safety for employees is the first and most important reason as many accidents have happened on machines that were only partly guarded and a vast amount of money has been spent in making sub-standard guards which had to be scrapped and replaced with standard guards, to comply with the codes of various state departments. To secure efficiency in accident prevention, standardization of safety equipment to protect human life and limb is

just as important as many other standards which are paramount in everyday life.

Mr. Jones still further amplified his subject by defining a standard guard. He said: "The codes of most industrial states make it mandatory that all belts be completely enclosed to a height of six feet from the floor or platform. Covering three sides of the belt and leaving the back side unguarded, unless it is close to the wall, is not standard; where belts are inclined, the guard must extend beyond lower run of belt to a vertical line of six feet six inches from belt to floor."

He declared that gears should be completely enclosed regardless of location and a small door should be placed at the top of the larger gear to permit of lubrication, and care must be taken in locating this door at a safe distance from the intake or contact point of gears; separate guards should be provided where several gears are placed close together with bearings between.

He described the various materials used in making guards saying that a half-inch mesh 18 gauge expanded metal or 16 gauge sheet metal should be used for the filler of all standard guards. He said that solid guards of metal or wood should not be used as many fires have occurred on account of heat generated where such guards have been used around working machines.

Major Causes of Accidents

W. J. Peacock, personal director of the Northern Paper Mills, Green Bay, Wis., led the discussion on "The other seventy-five per cent." This topic naturally followed the reading of the first paper in which the statement was made that 25 per cent of industrial accidents can be prevented by proper guarding.

Mr. Peacock stated that emphasis is naturally placed upon guarding at the outset of a plant safety program, as an evidence of goodwill, and quoted the experience of Milwaukee that machine hazards, while causing only 25 per cent of all industrial accidents, yet occasioned over half of the severity and cost. However, the reaction to the discovery that guards remove only one-fourth of all accidents should not mean discouragement but should awaken management to the size of the task. If we set our goal as the elimination of all accidents, or 100 per cent, then we will be interested in the experience of safety experts, who analyze the task as 25 per cent guarding, another 25 per cent organization and 50 per cent as education. What ought to be attempted from the standpoint of efficiency is set forth in the 1927 report of the American Engineering Standards Committee, which states that "Maximum productivity is dependent upon a reduction of accidents to an irreducible minimum."

Engineering opinion seems to be swinging toward the conviction that waste in industry is largely due to human factors. Safety work is of value particularly as waking up this human factor for the purposes of efficient production.

In this connection, the speaker noted the modern inquiry as to what we mean by "accident." Injury calls accident to our attention, but injury is incidental and varies much with chance factors. The "accident" reflects not simply a place of hazard, but a factor of potential waste, inefficiency and carelessness in a large sense. Non-injury "accidents" must be studied for the cause of much red ink and are worthy of attention by our cost accountants.

As emphasizing the growing importance of human factors in industry, Mr. Peacock enumerated classifications of non-machine accidents. Falling objects, falls of persons, stepping on or striking against objects, hand-tools, electricity, handling objects, electricity, explosives, hot and corrosive substances, occupational diseases, not to mention physical imperfections, all show that the human factor in neglect runs up insurance costs. The wide-awake safety man, co-ordinating with the entire field of production, is seeking these days to promote carefulness in all respects and to make his department potential for dividends of economy, loyalty and co-operation.

A thought-provoking instance was offered from the cost of accidents in the State of New York. Paper and Pulp mills in that state, during 1926, paid for some two thousand accidents combined medical and compensation charges of $626,164. View this amount as preventable waste, as the wide-awake safety man does, and it is a short step to his position that safety can and should pay good clean dividends. Go with the safety man into the further discovery, quoted by the National Safety Council from studies made by H. W. Heinrich of the Travellers Insurance Co., that over and above the tangible dollar that we pay for compensation and medical care, is an intangible four dollars for "incidental costs." This makes the safety man think that the real loss in New York, due to accidents, must be placed at something like $2,500,000 annually, and convinces him that not only should his job make money for his company, but it should make a great deal of money.

However, Mr. Peacock urged, before you get the idea that Safety can earn "easy money," it will be wise to consider that mental causes loom large in human injuries, and when you get into the field of psychology you need to work days and study nights. What to do for men who bring their home troubles to work with them, secretly worrying about debt, poor health, children keeping late hours, old age, or domestic infelicities; how to combat housing conditions, boozing, reckless driving; how to sell safety to both employees and management; here is a program which makes a man-sized job.

The speaker urged every safety man present to think his way into the entire problem of plant accidents and to aim to come through a hundred per cent.

Registration

Aetna Paper Co., Dayton, O.—K. C. Koedler.

Champion Coated Paper Co., Hamilton, O.—J. Robert Chambers, Cliff Cooper, Robt. Dare, Leo Geiser, George Heiner, Kenneth L. Faist. Roy Neal, Escar W. Phillips, Charles Stephens.

Crystal Tissue Co., Middletown, O.—Earl E. Grant.

Division of Safety & Hygiene, Ohio Industrial Commission—Charles G. Barth, L. O. Bonner, Nannie B. Hummel, Mary Kincaid, C. W. Schlachter.

Franklin Board & Paper Co., Franklin, O.—Robert H. Siegfried.

The Gardner & Harvey Co., Middletown, O.—Edward H. Butterfield, R. J. Murdock.

Howard Paper Co., Urbana, O.—K. C. Koedler.

The Jaite Co., Jaite, O.—J. Kreckel.

Maxwell Paper Co., Franklin, O.—K. C. Koedler.

Mead Pulp & Paper Co., Chillicothe, O.—Ernest Augustus, George Bropps, W. H. Brown, Charles Boblett, Clifford Brust, Fred Corcoran, George Johnston, Emerson King, Thomas Knox, George McKinnis, Herman Trainer, Irwin W. Schuler, Wm. Zimmer.

Northern Paper Mills, Green Bay, Wis.—W. J. Peacock.

Ohio Boxboard Co., Rittman, O.—Harry E. Hiers.

Oxford-Miami Paper Co., West Carrollton, O.—Russell Schunder, Frank V. Smith.

Phillip Carey Mfg. Co., Lockland, O.—A. O. Galloway.

The Paper Industry, Chicago, Ill.—J. W. Lehman.

The Richardson Co., Cincinnati, O.—Marion Page.

Sorg-Oglesby-Smith Paper Co., Middletown, O.—D. D. Thirkield.

Surty Mfg. Co., Chicago, Ill.—Roland Jones.

Wardlow-Thomas Paper Co., Middletown, O.—E. T. Judd.

Harold T. Edgar Appointed Sales Representative

Edgar Bros. Co., producers of American coating and filling clay for the paper industry, have appointed Harold T. Edgar as their sales representative, with headquarters on the 18th floor of the Hudson Terminal Building, 50 Church Street, New York City. These offices will be occupied on or about December 20th. J. Gilbert Mason, Jr., will be associated with Mr. Edgar at the New York office.

As Mr. Edgar is treasurer of Edgar Bros. Co., the new sales arrangement will bring Edgar Bros. Co. into very intimate touch with the sales office.

The H. T. Brand of clays are now well and favorably known, being given the preference in some of the largest paper mills in the United States. Having been engaged in the production of washed clays for nearly fifty years, the Edgars have a great background of experience in supplying American paper clays to the paper industry.

All purchases and sales correspondence should be addressed to the New York office. Invoices and correspondence relating thereto are to be handled as in the past from the home office at Metuchen, N. J.

The Minton Dryer Installation at Kenogami

Ogden Minton Submits Interesting Paper to Canadian Engineers

FOR some time past, the Minton vacuum dryer has attracted considerable attention and aroused no little interest. While it was generally conceded that the machine was based on perfectly sound principles, many were those who doubted the feasibility of applying them in the paper mill under modern paper making conditions. Definite proof has now been given that the dryer can and will work satisfactorily in a modern newsprint mill. Price Brothers and Co. installed one on their No. 1 machine at Kenogami, and this machine is turning out just as good paper as the other machines in that mill. Those who were fortunate enough to attend the Summer Meeting of the Technical Section of the Canadian Pulp and Paper Association last June had the opportunity to see the machine equipped with the Minton dryer in operation; but it had then been running only a short time. On December 1st the inventor submitted a most interesting paper to the Montreal Branch of the Engineering Institute of Canada in which he dealt at some length with facts concerning the Kenogami installation and engineering problems encountered and solved in building it and putting it into successful and satisfactory operation.

The vacuum dryer comprises a series of standard dryer rolls, together with dryer felts, felt-carrying rolls, hand and automatic guide rolls for the felt and an automatic stretch roll for the felt, all of which may be made exactly like those used on a standard paper-drying unit. The entire unit, however, is enclosed in an air-tight casing, usually made of cast iron, suitably ribbed and strengthened to withstand the pressure of the atmosphere. At the front and rear of the casing are inlet and outlet seals for allowing the paper to enter and leave the chamber without allowing air to enter. A condenser (either surface, jet or barometric) is connected to the bottom of the casing and also to a dry vacuum pump. The operation of this dryer differs from the standard type in that the air is pumped out of the casing and the paper is dried under a vacuum of approximately 28 inches of mercury.

Construction of Machine

The Kenogami dryer, which was built at the plant of Charles Waimsley and Co. (Canada), Ltd., at Longueuil, Que., contains twenty dryers, five feet in diameter, with a 152-inch face. It is now operating regularly 24 hours a day at a speed of 700 feet per minute, drying standard newsprint. This is by far the largest vacuum dryer that has ever been built, and it is the first one to be used in the commercial manufacture of newsprint. Moreover, until it was put into operation, no vacuum dryer had ever been operated at a speed in excess of about 200 feet per minute.

The casing is made of cast semi-steel plates having as close a grain as possible, special care being taken to see that they were free from blow or pin holes. The plates are bolted together, the contact surfaces being planed and then covered with a thick mixture of white lead and machine oil to make an air-tight joint. After assembly, the dryer was painted while under a slight vacuum, the porous spots being thus filled with paint and eliminated. In designing the various castings great care was taken to check each part for strength and deflection, and a liberal factor of safety was used in every case. So carefully and thoroughly was this done that, when the machine was put into operation and the actual deflections measured, the observed values generally checked the calculated values to within a few thousandths of an inch.

The entire casing is built of standardized sections, so that dryers can be readily added to or taken from it should the need arise. Doors and windows are provided wherever necessary to allow of observing what is going on inside the dryer or to give ready access for repairs. They are fitted with special gaskets, and in some cases hinged so that they may be quickly opened and closed.

All the dryer rolls are mounted on SKF self-aligning roller bearings. The size of the rear journal is of necessity large, in order to give sufficient area for the steam inlet and condensate outlet, and a bearing had to be used with a capacity considerably greater than necessary to carry the load. For the sake of standardization the front dryer bearings were made the same size as the rear bearings, and the outer races were slightly freed out to allow for expansion. The rear bearings are supplied with an automatic lubricating system to insure a constant supply of lubricant at all times, while the front bearings merely have a constant level of oil in which they run and which is so designed that these bearings when filled must always be filled to just the correct height.

The selection of the proper quality of oil was a difficult problem, as it was necessary that it be unaffected by the combination of high vacuum and high temperature to which it was subjected; and the solution of the problem required a considerable amount of research.

The selection of the bearings and oil was vindicated by the fact that since the machine was started up there has not been one minute of time lost due to bearings, and the quantity of oil used has been negligible. Moreover, the self-aligning feature of the bearings has completely eliminated any trouble from wobbling of the journals, such as very frequently occurs with drying cylinders due to temperature changes warping the dryer heads just a trifle.

The seals of the Kenogami dryer each comprise two 16-inch bronze covered rolls and one 14-inch rubber covered roll, the bronze rolls of each seal being set at a slight angle to each other to allow the paper to draw into the seal more easily. In the outgoing seal, the rubber roll is under the bronze rolls, making what is known as an "inverted seal," so as to improve the passing of the paper around the 24-inch sweat dryer and up over the 5-foot sweat dryer and into the calender stack. This arrangement has eliminated the vertical pass from the last dryer up to the nip between the bronze and rubber rolls, which was necessary with the earlier type of seal; the paper is doctored off the last top dryer and falls directly down into the nip of the inverted seal, so that this pass cannot fail.

The ends of all three sealing rolls are fitted with a special form of sponge-rubber sealing ring excluding the air at the ends. Where the face of the bronze rolls comes in contact with the casing, a sealing rubber tube is provided, filled with water under a pressure of about 5 pounds to make a fairly tight fit. As it is not practical to make this contact absolutely air tight, a small pond of water is provided in front of these rubber tubes, and a small amount of water leaks into the vacuum chamber whence it is led to waste or to the condenser. Each bronze roll is also provided with a wiping rubber, which removes the water adhering to the roll after it has passed by the pond, thus preventing it from wetting the paper.

A very rare and interesting phenomenon was recently observed in connection with the wiping and sealing rubbers. For some reason, they began to fail: they apparently would run hot, partially melt, then seize and be pulled all out of shape. The cause of the failure was finally traced to a chattering of the rubber, which set up a vibration, which in turn set up internal friction and generated enough internal heat to destroy the rubber. Substitution of a rubber having a different period of vibration eliminated this source of trouble, all of which was encountered with but one lot of rubbers.

Felt Porosity Essential

Experience gained in running the machine brought out the paramount importance of felt porosity. Even in an ordinary type of paper dryer, high felt porosity is desirable; but in a vacuum dryer it is one of the prime essentials. When the Kenogami dryer was first started up, it was equipped with standard cotton dryer felts. The wet end of the machine was a standard fourdrinier with couch press and three wet presses of standard make. The only trouble experienced in drying the sheet was a serious wet wrinkle about 12 inches in from the front and back edges of the sheet, and both edges were decidedly damper than the middle of the sheet. After much searching for the cause of the trouble, it was suggested that the trouble might be due to the closeness of the felts,

and asbestos dryer felts were substituted for the cotton felts. This effectively removed the wet wrinkles, and it was then possible to make commercial paper. This paper has since been shipped by the carload, and not one complaint has been received from the publishers.

As an experiment, the two top dryer gears were removed at one time, leaving the first dryer and the small baby dryer ahead of it geared together, while the first two top and bottom dryers were not connected in any way other than by the dryer felts. No trouble was experienced in putting the paper through the machine. A few hours later a break occurred at the wet end. The paper was threaded through the machine once more, and a couple of minutes later it was observed that, though the paper was running perfectly, No. 1 bottom dryer was not turning. The same phenomenon was observed a short time later by several of the plant engineers, and a third time by the inventor himself. The explanation of this most unexpected phenomenon lay in the fact that the felt was not sufficiently porous to allow all the water evaporated from the sheet to pass through, and in consequence the paper was actually out of contact with the dryer and riding on a film of steam. This brought home very forcibly the necessity of having a highly porous felt, particularly in view of the large volume occupied by the steam on account of the high vacuum carried in the dryer.

Condensing Equipment.

The condensing equipment used for the Minton dryer at Kenogami consists of a surface condenser, an air cooler, two dry vacuum pumps and two condensate pumps. Two pumps of each kind were installed, one of each to be held in reserve as a stand-by in case of accident to the other. The surface is connected in one of the mill lines and the water simply flows through it just as though it was an elbow in the line. The temperature of the water is raised only about 4° Fahrenheit under ordinary working conditions. This was installed as a temporary hook-up but it has worked so satisfactorily that it probably will not be changed. The few degrees' change in the water temperature is beneficial to the mill supply line, and the cold water is beneficial to the operation of the condenser. A 10-inch piston-operated vacuum breaker valve is provided in the line running to the vacuum pumps, by means of which the vacuum can be broken in a minute and a half.

When the condensing equipment was selected, there was very little data available as to air leaks, and the selection was more or less of a guess. Operation of the machine showed this guess to be pretty accurate for the conditions prevailing at Kenogami, and in a new design under the same conditions the same condensing equipment would be specified. Of course, the type of equipment required depends to a great extent on local conditions.

Threading Paper Through Dryer

To thread the paper through the dryer when running at low speeds (500 feet per minute or less) the end of the lead strip is lapped over a piece of cardboard (called a "go-devil") about 10 inches wide by five feet long. The device threads its way perfectly of its own accord, aided only by the doctors on the drying cylinders. But with speeds of 700 feet and over for some unknown reason the go-devil does not function. Two small air jets were then arranged to strike the paper just before it comes to the doctor on each bottom dryer. The paper coming from the third press is thrown into the nip of the ingoing seal, the air valves are opened, and the man passing the paper walks down and closes the valves after the lead strip has passed each pair of air jets. This method of threading the paper has given very little trouble: owing to the high vacuum the paper has sufficient momentum to pass through of its own accord; over the first few dryers the paper is so wet and limp that it has to be helped, but after that it actually can go through alone. A rope paper carrier could be fitted into the vacuum dryer without difficulty; but it was not considered desirable to put in the extra complication of ropes and pulleys.

Breaks inside the vacuum dryer are practically unknown, unless for some very good and obvious reason, such as paper coming from the third press badly torn on the back edge. Even should the paper pile inside the dryer, it is not a serious matter and the delay is not long. The Kenogami dryer has run for 37 hours without a break of any kind, and for whole weeks without any breaks or lost time traceable to the dryer. A full week's run has been made maintaining an over-all efficiency of 95 per cent.

Some Comparisons of Operating Costs

Just before taking out the original dryer on No. 1 machine, a test was carefully run over a period of two weeks so that a comparison could be made of the performance of the paper machine before and after installation of the vacuum dryer. It showed an average consumption of 9,540 pounds of steam, from and at 212° F., per ton of paper. It has not yet been possible to make such a test with the vacuum dryer; but measurements made with a carefully calibrated steam flowmeter indicate that the vacuum dryer requires only 5370 pounds of steam, making a saving of 43.8 per cent in steam. In addition, no heated air is supplied to the new dryer, as had to be done with the standard open dryer, making a further saving in steam.

Though no official tests have yet been run, it is considered that the total power requirements are approximately the same as before, the extra power requirements for the vacuum and condensate pumps being offset by elimination of the ventilating fans formerly used.

The shrinkage in width of the sheet from the time it leaves the last press until it reaches the calender stack was reduced from two inches, with the old dryer, to one inch with the vacuum dryer. The question of shrinkage, which has a very important bearing on the strength of the finished paper, depends to a large extent on the draws between the several dryers, and this in turn is very intimately related with the system used for driving the dryers. At Kenogami, the design provided for one top and one bottom dryer felt, all the rolls being connected together with standard dryer gears and no provision being made for any adjustment of the draws of the sheet between the dryers. A considerable improvement was made in the drive installed on the dryer section at the Ste. Anne Paper Co.'s mill, in which an individual motor drives only the first two dryers and the torque supplied to the following dryers can be varied by a rheostat on separate motors that again each drive only the next two following dryer rolls. In Mr. Minton's opinion, however, the ideal drive would be to have an individual felt and an individual motor on each roll, so as to obtain absolute control of each draw; but this would be much too complicated and out of the question for a modern high speed news machine. In future installations, Mr. Minton contemplates using a separate motor driving through a worm gear direct to each dryer.

As to felt costs, the machine has not yet been running long enough to obtain satisfactory data; but it should be noted that the felts used are only half the length of those used on standard dryers, that they operate at an average temperature of less than 110° F., as against about 170° F. on a standard dryer, and that they run dry, not wet, due to the fact that vapor formed under them is always slightly superheated. It is therefore estimated that the cost of felts per ton of paper produced will be only about one-fourth to one-third with the vacuum dryer of what they are with the ordinary dryer.

Important Improvement in Paper Machine

No sound theoretical criticism of the vacuum dryer has ever been made, but before the Kenogami installation doubt as to its commercial value had often been freely voiced. The results obtained with the Minton dryer in the actual production of commercial paper on a large scale is the best answer to these doubts. It marks a step forward in the art of paper making second only to the invention of the fourdrinier machine, and it is the only new and really important improvement in the paper machine for many years, with the possible exception of the suction couch and press rolls.

Discussion

The address, which was profusely illustrated by means of lantern slides showing the principles of the dryer as well as photographs of actual installations, was followed by an animated discussion.

J. N. Stephenson, of the Pulp and Paper Magazine of Canada, inquired whether it might not be possible to run the dryer with a large number of stationary rolls; but Mr. Minton replied that, after the first few dryers had been passed, the rate of evaporation was not sufficient to form the steam film between the sheet and the roll required to raise the paper out of contact with the roll.

Referring to Mr. Minton's comments on the drive used at the Ste. Anne Paper mill, C. R. Van de Carr, manager of the mill in question, stated that no tight draws had been observed on his paper machines. It had been found that the type of drive used causes but little shrinking in width of the sheet, resulting in greater width of the sheet as reeled and also in longer felt life. Mr. Minton considered, however, that it was very important to have perfect control over each draw in order to take care of the alternate expansion and contraction of the felt as it is alternately wetted and dried, and this could be best obtained by driving each roll individually. According to A. N. Russell, of Dominion Engineering Works, where the Ste. Anne drive was designed and constructed, the felt acts as the real synchronizer between the rolls in this type of drive. As it cannot be determined if the top and bottom felts act the same, some mechanical tie-in is required between the two, and hence he considered the Ste. Anne type of drive safer than the use of an individual motor for each roll.

Julian C. Smith, president of Quebec Power Co., remarked that by increasing the vacuum by about one-half to three-quarters of an inch the boiling point of the water contained in the wet paper would be reduced to about 50 to 60° F., and drying could be carried out without supplying any heat to the dryers. Modern tendencies were towards working under very high vacuum, as shown by the recent work of Georges Claude, and work along this line offered some very interesting possibilities. Mr. Minton's achievement was no mean one and it would doubtless spur others to make still further improvement in standard equipment. Referring to Mr. Smith's first remark, Mr. Minton stated that small increases in vacuum beyond a certain point became much more difficult and expensive to maintain, and a balance had to be struck between the cost of vacuum and cost of steam. So far, it had been found most economical to work with a vacuum of about 28 inches.

Closely related to the shrinking in width of the sheet is its stretch in length. At the Wayagamack mill in Three-Rivers it had been found that the stretch was approximately nine feet per wire length, while at the International Paper Mill in the same city it was only seven feet. Though he was unable to give conclusive evidence either way, Mr. Minton was inclined to think that most of this stretch occurred at the wet presses, and that little, if any, occurred in the dryer section, whether vacuum or standard dryer were used.

Another point raised was as to the difference, if any, in the quality and appearance of the paper after it has passed over 15 to 20 dryers under vacuum and after it has passed over 40 or more dryers at atmospheric pressure. At Kenogami, it had been observed, Mr. Minton replied, that the seal rolls acted somewhat as smoothing rolls, and that the main portion of sheet coming from the vacuum dryer had a smoother appearance before passing through the calender stack than uncalendered paper from the other machines. Trouble was experienced in finishing vacuum-dried paper, however, owing to the wet edges; this necessitated over-drying the paper and then sweating it to restore the proper amount of moisture, and under these conditions it was hard to obtain even results across the sheet.

W. G. Mitchell, of Price Brothers, remarked that very appreciable progress had been made in recent years in the removal of water from paper by mechanical means. At Kenogami, where the machines were equipped with solid presses, the paper reaches the dryers about 28 to 29 per cent dry, while with suction couch rolls and presses it could economically be delivered to the dryers not less than 32 per cent dry, and under very favorable conditions about 35 to 36 per cent dry. Such improvements naturally have a considerable influence on the amount of work remaining to be done in the dryer; but even under the most favorable conditions for the mechanical removal of water, the vacuum dryer still retains its importance and advantages. The question naturally arises as to whether the vacuum dryer operates as efficiently and as safely as the standard dryer. Though his company had not had sufficient experience with the vacuum dryer and had not accumulated enough data to give a definite answer to the question, experience and observations to date certainly pointed to the affirmative. More particularly, he was in a position to state that no trouble had been encountered so far due to the fact that the dryers were placed in a completely enclosed casing; and moreover, as pointed out by Mr. Minton in his paper, there had been a large reduction in steam consumption.

In his opening remarks Mr. Minton had stated he wished to make it clear he was not a paper maker and that he knew very little about paper making. Commenting on this statement, Mr. Van de Carr remarked that all the more credit was due to one who was not a paper maker for having taken the present initiative, particularly as there had been no radical changes in the principles of paper drying for the last 40 years or more.

Professor H. O. Keay, in moving a vote of thanks to the speaker, referred to the difficulties which are invariably encountered in bringing an idea or a principle from the theoretical and experimental stage to practical commercial operation, and he considered that Mr. Minton's achievement could serve as a lesson to all.

Mr. Stephenson seconded Prof. Keay by adding that he had already heard three papers and read two on the Minton vacuum dryer, and that he hoped he would hear and read still more about it.

E. P. Cameron, A. M. E. I. C., Chief of the Pulp and Paper Division of the Forest Products Laboratories of Canada, was in the chair.

Natural Reproduction of Pulp Wood*

By GEORGE N. OSTRANDER

Finch, Pruyn & Co., Inc., Glens Falls, N. Y.

THIS paper is intended to present, briefly, some results of forest management experience, and nothing more. A comprehensive presentation of the subject of natural reproduction of pulpwood involves a technical study not only of stand and growth but of the condition in which cut-over lands are left with respect to the amount and kind of reproduction, and of the many other conditions of the forest following logging operations. To make and interpret such studies and to present their results would be technical, lengthy and uninteresting as the subject of a paper to be read at a meeting of an essentially commercial character. Estimates of present stand and prospective yield have been plentiful. Logging and silvicultural practices have been investigated, commended or condemned. Some assert that reforestation affords the only assurance of a future wood supply; others, that natural reproduction will suffice. There has been a decade of speculation and controversy. A demand for research and definite results finally took form in the provisions of the Clark-McNary Act. Under it, forest experiment stations have been established in several forest regions. We, in the spruce region of the Northeast, are looking to the station at Amherst, Mass., for valuable data on the reproduction on pulpwood lands in that section. The best I can do is to submit a simple account of our experience in commercial forest management.

Like most of the paper manufacturing industries in the Northeast, our company had a sawmill background. It became interested in lumber manufacture as early as 1866, and with the rise of the paper industry in 1904 it constructed a mill for the manufacture of newsprint paper. For some years a sawmill was run in conjunction with the paper mill to utilize a small percentage of the better grade logs, but this has been discontinued. Unlike the sawmill, the paper mill cannot follow the timber. The money invested in a paper mill makes this impossible. In 1910, the Quebec Provincial Government

*Paper read at the first National Commercial Forestry Conference, called by the Chamber of Commerce of the United States, Congress Hotel, Chicago, Ill., November 16-17, 1927.

prohibited the exportation of pulpwood from its Crown Lands. This, with the diminishing supply of the pulpwood species (spruce and balsam fir) and with the increasing demand for paper pulp, made the natural reproduction of pulpwood the major object of all commercial forest activity throughout the spruce region of the Northeast. In 1910, we owned approximately 100,000 acres of pulpwood land in the Adirondacks. This was all situated on the watersheds of the upper Hudson River. The lands had never been under forest management, and our knowledge of the stand on them and of its growth was of the most general character. In a vague sort of way we understood that on an average these lands should produce annually one cord of wood for each eight acres of area.

In 1911, we employed a graduate forester and organized a forestry department. The lands were then cruised and accurate maps of the timber areas prepared, types and other data gathered on the cruise were shown on these maps, as was also the areas logged and the date of each logging. This cruise indicated that the land would not produce our wood consumption annually, and that to cut the land to meet our requirements meant that the exhaustion of the stand was but a matter of a few years. To assure the permanency of our industry it was apparent that we must have sufficient timber to go on a sustained yield basis, or to produce our wood requirements by reforestation. Reforestation was investigated and figures were prepared showing results to be expected from plantations of Red and Norway spruce, and as a result of these, conclusions were reached that, with a cost of not to exceed $15.00 per acre for land and stocking, pulpwood could be grown at a cost of $10.00 per cord in forty years. It was felt, however, that $15.00 per acre was too optimistic for plantations but might be a safe figure for natural reforestation, since it includes the value of the seed trees and other young growth left. It seemed probable that at the end of the forty year period pulpwood stumpage would be worth $10.00 per cord. It did not seem wise to use the forty year rotation for this calculation since at that age the spruce was too small to give maximum results.

Table I has been prepared to indicate the growth of both Red and Norway spruce on best, medium and poor sites for periods of forty and sixty years.

Table I

Site quality Data from BUL. 544 U. S. D. A. Tables 17 & 18	Breast High Diameter of Average tree (inches)			
	RED SPRUCE		NORWAY SPRUCE	
	40 yrs.	60 yrs.	40 yrs.	60 yrs.
Best	7.5	9.3	5.4	8.9
Medium	6.3	8.0	3.7	6.2
Poor	5.2	6.7	2.3	4.5

On the basis of 60 years the figures of cost per acre are as follows:

Land and Stocking (land value deducted at rotation age).
- at $10.00 per acre..... $326.88
- at $15.00 per acre..... 491.82
- at $20.00 per acre..... 656.77

Protection and Administration @ 5c yearly 26.66
Stumpage value Red Spruce Medium Sites... 480.00
Stumpage va'ue Norway Spruce Medium Sites 550.00

Yield Tax @ 15 per cent on stumpage.
- Red Spruce..... 72.00
- Norway Spruce..... 82.50

The results of this calculation are for Red Spruce on Medium Sites per acre at 60 years:

Cost per Acre	Total Yield	Total Cost	Net Profit or loss.
$10.00	$480.00	$425.54	$54.46
15.00	480.00	570.48	loss
20.00	480.00	755.43	loss

Norway Spruce on Medium Sites per acre at 60 years:

Cost per acre	Total Yield	Total Cost	Net Profit or loss.
$10.00	$550.00	$436.04	$113.96
15.00	550.00	600.98	loss
20.00	550.00	765.93	loss

From this it appears clearly that a profit can be obtained only if the cost of restocking is kept below $10.00 per acre for average sites. On the best sites the yield for Red Spruce shows a slight profit at $15.00 per acre and for Norway Spruce at both $15.00 and $20.00 per acre; but these yields are too uncertain to be attractive as an investment.

The fact remains that until stumpage values increase or planting costs diminish, an investment of over $10.00 per acre in reforestation is not to be recommended. Under present conditions this precludes planting and points to natural regeneration as the only economic means of restocking cut-over lands.

Forest Management Policy Adopted

This result naturally led to a study and finally to the adoption of a policy of natural reproduction and sustained yield, which, briefly defined, is a policy of forest management which balances the annual cut and the current annual increment of the forest. This policy required further substantial investment in timber at a time when there seemed little opportunity to make it. Since its adoption we have acquired approximately 140,000 acres of additional pulpwood land in New York State, increasing our holdings there at the present time to approximately 240,000 acres. We have acquired 25,000 acres in Maine and a few small areas in Vermont. For the past fifteen years, we have supplied 50 per cent of our wood requirements through the exercise of a cutting right on 40,000 acres of seigniory land in the Province of Quebec; the remaining 50 per cent being largely supplied through the purchase of Canadian wood, thus relieving our U. S. land holdings from practically all cutting during this period.

Growth of Spruce and Balsam Studied

In 1924, we undertook a study of the growth of spruce and balsam on our lands in New York State. This study was made under the joint supervision of Prof. A. B. Recknagel of Cornell University, and Howard L. Churchill, graduate forester of the University of Maine, who is and since 1910 has been forester for Finch, Pruyn & Company, Inc. This study had as its object the determination of the average annual increment in cords, the result to be stated in such form as to be readily comprehended without technical knowledge of forestry. The area was first classified as to forest types as follows:

(a) Barren
(b) Water Surface
(c) Mixed hardwood type
(d) Spruce, flat type
(e) Spruce, slope type
(f) Swamp type

These types were then subdivided into forest conditions:

(a) Cut over within five years
(b) Cut over within ten years
(c) Cut over within twenty years
(d) Cut over within thirty years
(e) Cut over more than thirty years ago
(f) Virgin

The preparation and compilation of this data was possible from the record of the previous work of our forester, who had been keeping careful data of all the areas for the decade which our properties had then been under forest management. The type boundaries were first plotted on enlargements of the United States Geological Survey Maps and the condition areas were later plotted upon the same maps. Briefly described, the field work consisted of starting at one corner of a section and running a line, say due north, by compass and pacing twenty (20) chains. From here a line is run, say due west, ten (10) chains and a quarter acre plot is established from which the data hereafter described was taken. The line is then extended twenty (20) chains further and a second plot established and the field work continued in this way. The result, for example, is that on a section a mile square, containing 640 acres, we have two sample plot lines each twenty (20) chains from the outside boundaries and each forty (40) chains apart. Along these lines we have quarter acre plots, each twenty (20) chains, giving eight (8) quarter acre sample plots to the section. The data secured on these quarter acre plots was as follows:

(1)—Caliper record of all pulp wood species, five (5) inches, D. B. H. and up.

(2)—Caliper record of all hardwoods nine (9) inches, D. B. H., and above.

(3)—The Balsam, spruce and pine trees were grouped into three classes, those from five (5) to nine (9) inches, D. B. H., in one class, those from ten (10) to fourteen (14) in another class, and those from fourteen (14) inches up in a third class.

Then by basal area the mean sample tree in each group was determined. The following measurements were taken for each mean sample tree; D. B. H. high, years required to grow number of inches at breast high, bark thickness. The data on reproduction consisted in determining whether there was sufficient to restock the area. The mortality was determined by a study of the dead timber on the area. This data was computed to determine the C. A. I. (current annual increment) per cent of the stand. This C. A. I. per cent was then applied to the stand as determined by a check cruise of the 1910 cruise. The forecast of annual growth was determined as follows:

To the volume of the living trees, the annual mortality per cents was applied on the assumption that the death rate would continue uniformly; to the volume so reduced was applied the growth per cents found as previously. From these, tables were made showing the annual growth at the annual rate per annum in cubic feet. The results in cubic feet were then converted into cords by using the basis 90 cubic feet equal one cord.

The foregoing description of this study is of course short and general and intended to give the layman an idea of the fundamentals of the study. Table II presents a summary of the result:

TABLE II

SPRUCE

Type	Acres	Volume Cu. Ft.	Growth Cu. Ft.	C.A.I. per acre Cu. Ft.	C.A.I. per cent %
Hardwood	119,406	40,729,687	905,220	7.581	2.22
Spruce Flat	31,259	22,320,770	365,639	11.697	1.638
Spruce Slope	27,904	44,955,133	986,927	35.36	2.195
Swamp	3,025	1,149,766	31,794	10.501	2.765
Totals	181,594	109,155,356	2,289,580	12.608	2.097
Or in Cords*		1,212,837	25,440		

BALSAM

Type	Acres	Volume Cu. Ft.	Growth Cu. Ft.	C.A.I. per acre Cu. Ft.	C.A.I. per cent %
Hardwood	119,406	5,802,874	231,721	1.940	3.99
Spruce Flat	31,259	11,449,261	392,785	12.5655	3.43
Spruce Slope	27,904	7,936,403	203,846	7.30	2.568
Swamp	3,625	1,833,981	53,406	17.654	2.912
Totals	181,594	27,022,519	881,758	4.855	3.263
Or in Cords*		300,250	8,797		
Grand Total Spruce and Balsam in Cords		1,513,087	34,237		2.38

*NOTE—1 Cord taken as—90 Cubic Feet.

This study naturally attracted considerable attention, and it has been the subject of many critical papers, one of which I think was published in the Journal of Forestry some two years ago. Timber acquired since the foregoing table was prepared has increased the C. A. I. of our present holdings approximately 4,500 cords. Our present annual wood consumption is between 40,000 and 45,000 cords. We are continuing the acquisition of timber and shall do so until there no longer remains a doubt of our ability to safely manage our forests on the strictly sustained yield basis.

I wish, in passing, to direct your attention to the bulletin on reproduction on pulpwood lands in the Northeast, prepared by Mr. Westveld of the Northeastern Forestry Experiment Station at Amherst, Mass. I am without permission to publish this bulletin, but with due acknowledgment to Mr. Westveld and to the Forest Service, I think I may re-state a few of its conclusions which are of commercial interest, and are supported by our experience in the management of our forests. These conclusions are as follows:

Conclusions from Northeastern Forestry Experiment Station

1—In all types of cut-over land, the forest is generally well stocked with spruce and fir reproduction.

2—This is true regardless of the severity of the cutting.

3—In the mixed hardwood type, cutting must be followed by special cultural treatment, to prevent encroachment of the hardwoods.

4—Girdling of hardwoods has a place in such cultural treatment.

5—The amount of reproduction varies with forest type spruce slope, showing the largest, spruce; flat, next; and mixed hardwoods, least.

6—In general the forest returns to type; the largest reproduction of spruce and fir being found on areas which had originally supported the largest volume of spruce and fir.

7—The spruce flat and spruce slope types usually maintain their original representation. In the mixed hardwood type, hardwoods will to a considerable extent supplant the spruce and fir.

8—Even in the mixed hardwood stands, it is not unusual to find a satisfactory re-stocking of spruce and fir.

9—The spruce flat type shows a tendency to produce large numbers of spruce and fir seedlings and a relatively small number of hardwoods and wood species; the spruce and hardwoods type fewer seedlings of the pulpwood species and large numbers of hardwoods and weed species; and the spruce slope type, great quantities of coniferous seedlings but at the same time numerous hardwoods and weed species.

10—Spruce and fir reproduction in the spruce flat type experiences much less difficulty in maintaining its position with the contemporary hardwood growth than in the spruce and hardwoods type. Coniferous reproduction also meets severe competition from young hardwoods in the spruce slope type, but meets little overhead competition from residual hardwoods and will eventually dominate the stand.

11—The extent to which advance reproduction is benefited by cutting is directly proportional to the severity of the cutting.

12—Removal of the old stand changes site conditions, but exposure to added sunlight with accompanying changes in soil conditions results in damage to only a small percentage of the advance reproduction.

13—When the purpose of management is to maintain pulpwood species in the stand, reproduction of these species should be established prior to logging.

Does the experience related in this paper prove the preference for natural reproduction over plantation reforestation a wise one? The speaker thinks it does under the circumstances described, but confesses that the circumstances under which the policy of timber acquisition was successfully completed may not be duplicated except in a very limited number of cases. He does believe that the sustained yield basis is the solution of the problem of wood supply for the paper industry in the Northeast. Eventually, wood consumption and yield must balance. If forest management can't make the balance, paper production must.

Merger of Holden and Keystone

Continuous production of paper novelties, from the raw pulp to fancy boxes, stationery, greeting cards and note-books, will be possible in the new mill of the Spencer-Wynne Paper Products Corp., construction of which is almost finished at Newburgh, N. Y.

The new plant, which with equipment will cost $270,000, represents a consolidation of the Holden Paper Co., of Newburgh, N. Y., with the Keystone Papeterie Co., of Philadelphia. Building is being done by the H. K. Ferguson Co., of Cleveland, O., at a cost of $95,000. It is expected to be fully equipped and ready for occupancy by January 1. P. D. Wynne, who was president and principal owner of the Keystone Co., will be in charge of the new plant and Leslie White, of the Holden plant. Mayor Roy W. Spencer, of Newburgh, is president of the new corporation.

Electrical Experiences at Price Brothers & Co., Ltd.[1]

By N. D. PAINE

Electrical Superintendent, Price Bros. & Co., Ltd.

IN HIS letter asking that a paper be prepared for this occasion, Mr. Leeper, manager of the pulp and paper department of Canadian General Electric Co., wrote as follows: "In holding this meeting, there are two thoughts in mind; first, to become better acquainted with our customers and their problems; second, to determine wherein we can build or so improve our equipment that it will better fulfill the requirements of this basic industry."

We will all agree that our hosts succeed most admirably in the first thought, especially those of us who took the course in lubrication last year in Schenectady. That particular kind of oil can be mixed with water quite easily and surely succeeded in getting everybody better acquainted.

As to our problems and the necessity for improving equipment, it is safe to say that allowing for a few local conditions, such as peculiar stream flow, power factor, or load factor clauses in the power contracts, our experiences are all very similar, whether we are operating in Wisconsin, Ontario or Quebec. The following remarks necesarily refer to the operating conditions which prevail in the mills of Price Brothers & Co., Limited, at Kenogami and Riverbend with which the writer is connected.

When our Company entered on its expansion program four or five years ago, it fell to the lot of those who had been operating the electrical department to design, choose and install all electrical equipment from transmission lines to the lighting distribution. Such a policy made it possible to take advantage of all past mistakes and select apparatus which we had reason to believe would give satisfactory service. In the case of new applications, however, we were still learning, but tried to benefit by the experience of others.

The program was actually based on a large block of cheap electric power, mainly for electric boiler consumption, to be purchased for a plant which the Duke-Price Power Company were to build at Isle Maligne on the Saguenay River. In addition to this block of two hundred thousand horsepower, we already had a power system which delivered from thirty-five to thirty-six thousand horsepower at the Kenogami Substation bus, depending on the season of the year. Ninety thousand horsepower of the Duke-Price contract were to be transmitted to Kenogami for use in three twenty-eight thousand k. w. electric boilers, and to supplement the existing supply. This was done with three circuits, any one of which can be parallel with our own system. With the entrance of the Shawinigan in the Duke-Price Company, however, we have dropped 100,000 horsepower, but are still using two of these three circuits to balance our loads properly.

The chief operator has full control of the system from this point and incidently operates the grinder motors which are situated in an adjacent building. The switching for the electric boilers is also controlled by the same operator.

The mill power distribution is at 550 volts and is handled by twenty-eight circuits. In laying out the distribution, each mill department was kept separate from the others in order to meter the various loads independently for accounting purposes. There are several cases, however, where spare motors such as stand-by boiler feed pumps, air compressors, etc., are connected on different circuits to give added reliability. Except for the special application of sectional drive grinders and water supply pumps, all mill motors are of the squirrel cage or wound rotor motor types which every plant uses. Compensators are wall mounted and all of the control for a wound rotor is assembled on a vertical angle iron frame work which is also common practice in many plants.

Recent Improvements in Motors and Control Apparatus—At this point, it may not be out of order to mention several improvements in motors and control apparatus, which have been made in recent years and which tend to make an electrical superintendent's life almost worth living. The welded rotor gives us absolute freedom from the worry of loose rotor bars. We all have had many a Sunday spoiled by having to solder a few bars back where they belonged. Also, how many bearings have we changed, because of carelessness on the part of an oiler, or the ring getting stuck. That particular bit of drudgery can be largely done away with by properly applying ball and roller bearings. This subject caused some discussion in Schenectady, but with the past year's additional operating experience, we of Price Brothers & Company, Limited, are more favorably than ever inclined towards this type of motor. While mentioning ball bearings, I trust it will not be inappropriate to compliment our hosts, the Canadian General Electrical Company, on the very excellent motors of that type which we are now purchasing from them.

The present day compensators are also infinitely superior to the older type. Many a motor has run single phase because the flexible cable broke off in the old-fashioned rotating block, or the dash pot relay stuck and refused to function. Possibly the greatest improvement has been the recently perfected thermal relay. All of our recent compensators are equipped with this feature, much to our satisfaction. The only thing lacking is an automatic reset, as we often find a compensator handle propped in with a block of wood, where some non-electrical mill hand has started the motor after the relay has tripped on overload. Interlocking the controller and oil switch of wound rotor motors has, undoubtedly, saved us from blowing many main fuses, by preventing the motor from being started with the secondary resistance cutout. In the few places where we have remote push button control, we are getting good operating results with very little maintenance. We did have some difficulty with remote control starters on our magazine grinder lifts but in justice to the starter, I will say that those originally supplied were slightly under capacity.

In common with most paper mills, the "piece de resistance" from an electrical point of view is the sectional drive. This development has been so thoroughly described in the past two or three years by all three manufacturers, that the various features of each type are well known to all, and need not be mentioned here.

In Kenogami, we have two of the mechanical interlock type on our 234-inch machines, which, in spite of occasional interruptions, are giving good satisfaction. One of our early troubles consisted of very serious flash-overs, which occurred when the dryer motors on one machine changed from series to parallel operation. We tried lengthening the accelerating period using more stops in the series resistance, adjusting brush position, in fact, everything anyone could suggest. We also wanted to believe that the starting duty on that machine was much heavier than a similar machine across the aisle. Such was not the case, but it so happens that the running load is on an average fifty horsepower more, in spite of the fact that the machines are exactly the same size. Eventually, the motor was changed after a bad spill over and our troubles ceased. We learned later that it had slightly different field characteristics from the others in the same purchase, and would not operate safely in parallel with any of them.

The most serious complaint we have from the paper makers has been that of variation at the suction couch; in other words, the tendency of the sheet to drop into the pit, apparently caused by the couch motor speeding up. We naturally assumed the blame for this trouble, but were absolutely unable to find anything wrong with the motor or control. I have seen the same trouble on the couch rolls at Port Alfred. These couches are driven through cone pulleys from a main shaft, which more or less proves that the dropping is a function of the suction couch, and not the sectional drive. We also get complaints about press variation, but it is quite noticeable that these only occur towards the end of the week some time after Sunday washup.

The winders of these electrically operated machines are driven by D. C. motors fed from the main paper machine generator bus. This is not a good feature, as any slight trouble here is reflected quite noticeably in the dryer speed.

[1]Presented at meeting of pulp and paper specialists, guests of Canadian General Electric Co., Toronto, Ont., October 13 and 14, 1927.

It may be an initial economy not to supply a separate source of D. C. for a winder drive, but in the long run, the saving stops there.

Bringing Kenogami's Equipment Up to Date—The Kenogami Mill was constructed in 1914 which means that practically all of the original equipment is still in service. About six or seven years ago, we started on a campaign to modernize this older apparatus, with a result that many compensators have been equipped with newer type of double throw switch, dash pot relays changed to thermal type and so on. A definite policy of giving each motor a thorough overhauling whenever the opportunity presented itself, was adopted. During the past three years, all squirrel cage rotors have been welded and balanced, as the various motors were taken apart. On the wound rotor motors, brush capacity was doubled, the old type short-circuiting switches removed and a single blade, three contract, knife switch connected in the secondary circuit to reinforce the controller contacts.

The most beneficial change has been that of applying ball-bearings to about eighty of the older motors, especially on all sizes up to twenty horsepower inclusive, and in one case, a one hundred and fifty horsepower, three bearing motor was so equipped. In this work we were ably assisted by members of our machine shop force who have been very interested in this change. The great benefit derived is the fact that we always found great difficulty in keeping oil from getting on the windings with the resultant deterioration of insulation, particularly in the closed slot motors. We all have varying ideas as to the percentage of winding failures due to oil soaking; personally, I feel it rather high. Lubrication is much more reliable providing the proper grease is applied. There are no rings to jump off the shaft, and should the grease cup be broken from the housing, the lubricant will not leak out as is the case with oil. Also there are very few cases of rotors rubbing on stators.

There is at least one application where the results of the change has been fully appreciated. The exhaust systems on machines number one to five is not all that could be desired, consisting or three ventilating fans over each set of dryers. These fans with their motors, are all housed individually in small shacks on the roof. One trip across this roof on a cold January day, would easily demonstrate that these motors operate under rather unfavorable circumstances and explain why we had so much trouble in this particular location. Since ball-bearings have been in service here, burn-outs have been reduced to an absolute minimum.

Maintenance Crew and Its Work—There are about five hundred and twenty-five motors in the Kenogami mill which require an operating crew of four men per shift; motor-man, motor-man helper or oiler, paper machine drive operator and pump house operator. The work of this motor-man is supplemented by an inspector who has somewhat of a roving commission, looking for incipient trouble and making minor repairs before major breakdowns can develop. There is also a maintenance man who does nothing but keep the lighting distribution in order. In common with the average paper mill, the electrical crew does all repairs, from fixing an extension cord to winding generators. They also make all coils, except those for our 6600 volt apparatus. This is the usual practice in almost all plants, and is fully justified in our case, where we are so far distant from the factories of commercial repair shops. It also tends to fill in slack periods when there is not quite enough work to go around.

Wattmeter Charts Settle Arguments—In an attempt to become thoroughly acquainted with all mill conditions, the electrical superintendent at Kenogami has recently completed a fairly comprehensive series of load tests on the more important motors throughout the plant. These graphic wattmeter charts give a true picture of what is going on and can be used to very good advantage in studying mill conditions. Some years ago, when our power system was considerably smaller than it is at present, we were bothered by excessive frequency variation. In trying to determine the cause of this, we connected a wattmeter in one of the two exisiting 2800 horsepower grinder motor circuits. The motor was driving eight three-pocket grinders, the load of which average over 3000 horsepower continuously. In general, the load was fairly steady, but the chart eventually showed periods of from three to four hours duration when the motor input varied between 800 and 3800 horsepower. Such a chart, naturally, indicated a varying pressure on the pistons, which condition was eventually rectified. This feature of shooting trouble with a graphic needs no further mention, as, undoubtedly, all mill men present have won many a hot argument with the assistance of this type of meter.

Power for Riverbend Mill—Returning to the question of our expansion program which was mentioned earlier, the remainder of the power purchased from the Duke-Price Power Co., Limited, is to be used at our Riverbend mill, one mile and a half distant from Isle Maligne, which is, at present, only one-half completed with two electrically driven 234-inch machines in operation. Power is supplied at generator voltage 13,200, to the sub-station ring bus. Grinder motors and boilers operate at this potential and, although it may be considered rather high by some, operating results have fully justified the installation.

Here, as in Kenogami, our mill motor voltage is 550 and the same type of distribution is employed. It was also desired to have all motors of the ball-bearing type, but deliveries could be obtained on only three-quarters of the order. Again the ball-bearing has proven itself, to our satisfaction at least.

Equipping a mill completely with ball-bearings was rather a bold step and, after much discussion pro and con, it was decided to require the manufacturer to machine the bearing housing so that a wider unit of the same diameter could be installed in the event of bearing trouble. This provision has been fully justified, as there have been a few failures, all of which were due to excessive belt pull or poor lubricant; in each case, a wider bearing was applied, thus overcoming the trouble. The Riverbend motor control apparatus being only two years old, contains all the newer features previously mentioned. There has been some trouble from burn-outs of compensator undervoltage release coils and auto transformers in oil switches. Of the sum total, however, it has been such a small amount that we would not hesitate a moment to duplicate our present layout, should the occasion arise.

In the foregoing, an attempt has been made to describe briefly our electrical layout and experiences. In the main, they are no different from those of the average mill. We have our short circuits, big and small, grounds, and all the multitude of troubles which constitute the electrical superintendent's daily dozen. There is, however, one feature which is met in only one or two other plants, namely, the size and extreme flexibility of our power supply. Apart from the contract amount of 100,000 horsepower from the Duke-Price Power Co., Limited, and our own 32,000 horsepower or more, there are available from time to time, rather large blocks of spare power from either the Duke-Price Company or the Shawinigan Company. With 62,000 kw., electric boiler capacity; an up-to-date pulverized coal plant and a steam accumulator at Riverbend, and 74,000 kw. in electric boilers, and an 8,000 boiler horsepower coal plant at Kenogami, we can juggle loads of fifteen or twenty thousand kw. with the same case as we formerly handled so many hundreds of kilowatts. The largest total load carried at our sub-stations for a twenty-four hour period was 196,000 horsepower, which represents a few kw. hours more than many a large central station turns out in a day.

Ordinarily we will have four circuits in service from the Duke-Price plant, transmitting our contract power, two to Riverbend and the others to Kenogami, which are not all paralleled, however. In order to totalize this power, we have installed a recording system which has been developed recently by the Lincoln Sangamo Company, in conjunction with the Ontario Hydro-Electric Commission. In fact, there is one in operation here in Toronto. It consists of applying a thermal generator instead of a wattmeter at the point to be metered. This unit generates an E. M. F., in a thermo couple which E. M. F. is recorded on a Leeds & Northup Millivoltmeter. In our installation, the thermal generators are at Isle Maligne with the thermo couples in series. A two conductor lead-covered cable, 8,000 feet long, connects them to the recorder at

Riverbend. Thus, our own operators know at all times how much power we are receiving and are able to prevent any overrunning of the contract amounts, thereby avoiding penalty payments.

In conclusion, it is perfectly safe to remark that after having operated a considerable amount of up-to-date equipment during the past two years, it is the firm opinion of those in charge of our mill electrical departments that modern electrical apparatus carefully applied and properly operated fully meets all demands imposed upon it by the newsprint industry in its present state of development. This is our answer to the second thought expressed by Mr. Leeper, mentioned in the first paragraph of this paper.

MICHIGAN NEWS

Milham Addresses Superintendents' Ass'n

At the last regular meeting of the Michigan Division of the Superintendents' Ass'n, held at Kalamazoo, E. G. Milham, chemist of the Bryant Paper Co., was the speaker of the evening. He addressed the meeting as follows:

Quality Maintenance—In this day of keen competition in the paper business, we hear a good deal about maintenance. However, the term is usually applied to the physical equipment of the plant and not often to the quality of the product. It is practically universal practice in our industry to let the customer determine quality. The result is that, generally speaking, the physical characteristics of paper made in so-called "good times" are not the same as those of the same grade of paper made when business is bad and the customer unreasonably critical. This is not a good condition and is one which must be corrected before the paper business can be put on anything like a scientific basis.

There can be no fixed definition of the term quality, as applied to a piece of paper. The word merely represents the opinion of some person or group of persons relative to the utility or value of a given sheet. In other words, quality, generally speaking, is not determined by the cost or difficulty of making a sheet; but rather by the state of mind of the person judging it.

In order to put the determination of quality on a firmer basis than mere impression, it might be well to consider the following seven points which have a vital bearing on the utility of paper and are subject to more or less accurate mechanical measurement.

Important Points in Determining Quality—The first point is whether the paper will do the thing that is desired of it. This can be determined with considerable accuracy if a careful systematic study is made of the conditions which the sheet must meet from the time it leaves the paper mill until it is finally discarded by the ultimate consumer. More careful study along this line would unquestionably save industry thousands of dollars yearly through the more intelligent fitting of the character of paper to the conditions which it must meet. No doubt, every superintendent here tonight has in mind numerous instances where customers are using high cost papers where lower cost papers would do much better work.

The second point is whether the paper is the right strength. This is a very important point because there is a right strength for every requirement. It often does as much harm to go above the right strength as it does to fall below it. For example, most of you know of instances where a too high bursting or tearing strength are positively detrimental in making paper to meet certain requirements.

The third point is whether the sheet is sufficiently clean. Of course dirt in any paper is not desirable; but there is still plenty of room for study of the cleanliness requirements of a paper for various uses and for the setting up of more definite standards in this matter.

The fourth is whether the sheet has the right surface to meet the requirements.

The fifth point is whether the sheet has the right color. In the past, this has been largely a matter of personal preference. Considerable work has been done to determine the relation of color to eye strain and the results of this work are available in the literature. However, these studies have so far had very little effect on the standardization of shades, as most of you men know.

The sixth point is whether the paper will satisfactorily go through the manufacturing operations between the paper mill and the ultimate consumer. This matter is, of course, very important, and, at the present time, it seems to be getting plenty of attention and study.

The last point is whether the sheet has any mechanical defects such as uneven or wrong bulk or weight, wrinkles, tears, holes, etc. This element unquestionably has far more influence on the utility of paper than any of the other items listed above. It is especially important for you because you can have fairly close control over these factors. I am hoping that the discussion will bring out a good many points on the best ways of reducing these mechanical troubles.

Controlling Factors—The first step in controlling quality is the exact and complete determination of the requirements of the sheet. Any superintendent who does not have this information and is hoping to get along by blindly trying to match a sample, is working under a terrific handicap. Every superintendent here should try to impress upon his manager the absolute necessity of getting real information on the detailed requirements of every grade of paper made by his mill.

The second step in controlling quality is the more exact control of raw materials. It is very essential that the superintendent work very closely with the purchasing agent, and that the latter work with the laboratory, to the end that raw materials may be controlled as completely as possible.

A third and very important step in quality control is the keeping of the plant in the very best possible mechanical condition. No superintendent or papermaker living, can produce paper twice alike with inadequate, wobbly, or obsolete equipment. The superintendent should hold himself strictly responsible for plant maintenance and should never get into the lazy habit of using plant conditions as an alibi for non-uniform paper.

The last point in quality control is constant watchfulness, using all the eyes available. A valuable set of eyes in this connection are the following instruments:

The Mullen tester for measuring the bursting resistance of paper;
The Elmendorf tester for measuring the tearing resistance;
The tensile tester for measuring pulling resistance;
The folding tester;
The Glarimeter for measuring the light reflected from the surface of paper;
The penetration tester for measuring the degree of sizing;
The inspection box for counting dirt and observing formation;
The ash tester for determining the quantity of mineral loading.

These are very good instruments; but are a long way from being infallible. Many mills make the sad mistake of attempting to control quality from this end by means of these machines. They even go so far as to hire a crew of men to make all the above tests on every reel of paper. While this procedure is very valuable so far as maintaining uniformity is concerned, it can never maintain or control quality, because no machine has ever been made or ever will be made which can definitely determine the utility or character of paper.

Placing the Responsibility—The responsibility for quality should rest on three men and no more. These are: The man who accepts the order, the superintendent and the papermaker.

The man who takes the order should see that information concerning the requirements of the paper is definite and detailed, and should know before he takes the order that the mill is physically equipped to make a type of sheet which can meet these requirements. The superintendent should see that the plant, machinery, and operating personnel are in condition to make, with unfailing uniformity, the character of paper desired. He should also, of course, keep a watchful eye on raw materials. By far the largest responsibility in the matter of quality rests with the man who makes the

paper, the machine tender. He is the only person in the institution who sees all the paper made, and is the only person who is in a position to discover and stop a majority of the irregularities in the quality of paper being made. It is suicidal to put final responsibility on any one other than the papermaker. If the papermaker has any just causes for alibis, the superintendent is to be blamed.

In the above remarks, I have very briefly outlined a few of the outstanding points of quality maintenance and have undoubtedly made numerous statements with which you cannot agree. However, to start the discussion, may I suggest the following questions which have a vital bearing on quality maintenance.

Discussion:

(1) Why do routing testing systems usually fail when given the responsibility for quality control?

(2) How far should the customer be taken into the confidence of the manufacturer?

(3) Should the customer be encouraged to learn about the papermaker's troubles?

(4) Is it possible to avoid letting up on quality in times when business is good?

(5) Would it be a paying investment to have the superintendent spend at least two or three weeks per year in the plants of customers?

(6) Would it pay to take papermakers on an occasional day's visit to plants using large quantities of paper?

(7) Would a community school for papermakers be a safe experiment?

(8) Would a properly worked out bonus system of wage payment have any influence on quality?

After a great deal of discussion the superintendents arrived at the following answers to the above questions:

(1) Routing testing systems usually fail when given the responsibility for quality control because these systems are all based on mechanical devices which are not infallible, and take away from the papermaker judgment which he has gained by years of experience and no mechanical device can replace.

(2) The customer should be taken into the confidence of the manufacturer to such an extent that he knows the manufacturer is doing his best to meet his requirements.

(3) By all means the customer should be encouraged to learn about the papermaker's troubles, because if the customer understands the difficulties the manufacturer has to overcome to meet some requirements there will be a better understanding all around.

(4) It may be possible to avoid letting up on quality in times when business is good, but it is not a very good policy to do so.

(5) It would be a paying investment to have the superintendent spend at least two or three weeks per year in the plants of customers because by doing this a superintendent becomes acquainted with the printer's troubles and in a great many of cases can make paper that will overcome these to the advantage of both printer and manufacturer.

(6) It would pay to take papermakers on an occasional day's visit to plants using large quantities of paper as they would have a better understanding of what a little defect here, or a bad splice in a roll of paper, or other things which might seem trivial to them, means to the printer and would make them better workmen and more valuable to their employers.

(7) Community school for papermakers could not help but be an advantage to a papermaking community, because it would give those desirous of learning an opportunity to do so, making them more valuable to the mills.

(8) There are some bonus systems in operation today that are working out to an advantage in some paper mills, both as to production and quality but it does not always work out right.

Mill Lubricating Engineer

An innovation in local paper mill circles and mill operation is the appearance of a lubricating engineer. The official in question is C. E. Barry, at one time connected with the Kalamazoo Vegetable Parchment Co. He has been engaged in his present capacity to work jointly for the Allied Paper Mills, Bryant Paper Co., and Western Board and Paper Co. to determine proper lubricating costs for those concerns.

Mr. Barry considers lubricating an important item in paper mills, just as it is with any industrial concern that operates heavy batteries of machinery. A concern like the Bryant or Allied will spend $15,000 annually for oil. That amount is sufficient to warrant close observation, and, if possible, to institute reforms that will effect savings, at the same time maintaining lubrication at a high state of efficiency. He will keep a check on the oil used by the concerns mentioned both as to quantity and quality.

Machine to Be Added at Parchment

An expansion program requiring an outlay in excess of $1,250,000 and increasing the capacity of the plant from 225 to 300 tons daily is announced for the Kalamazoo Vegetable Parchment Co. by its president, Jacob Kindleberger.

The campaign is to include the installation of a new machine and auxiliary equipment in mill No. 2, thus completing that unit and making possible the use of its facilities on a basis of 100 per cent, numerous changes in the present Glendale division and the erection of a fine office building.

The new machine will be of the fast running type, at least 165 inches wide and with 40 dryers and two stacks of super calenders. The present machine in the No. 2 mill has 32 dryers. It also will be necessary to add eight large beaters and three jordans to the equipment and triple the mill's bleaching capacity.

The power building is ready to receive the added power equipment, which will include two boilers, making seven in all in that unit, and a large steam turbine.

In connection with this program, it will be necessary to erect a large building for the special treating of papers made on the new machine. This structure will be 90 by 300 feet, three stories high, or 84,000 square feet of floor space. It will be of pressed brick and reinforced concrete, carrying out the splendid type of construction in effect when the mill proper was built. Some very special types of machinery will be installed and involve some highly interesting processes.

Changes at Glendale, partially and in process, include transformation of the upper floor for the use of the composing, stereotyping, and advertising departments. First and second floors are to be used for special processes in oiling papers, which are designated as "food protection papers."

The office building will be a great improvement. Ground has been broken for this structure which will be located practically in the center of the great parchment industrial district, and will make it possible to concentrate all office activities under one roof. The structure will be 75 by 110 feet, three stories high. It will be of pressed brick, with white stone trim, and in every way a handsome and serviceable unit. The basement floor is to be used by the employment and purchasing departments. The executive offices and general accounting room will occupy the main floor, while the third floor will be devoted exclusively to sales and associated branches.

Kraft and Paperboard Exchange Statistics

The American Paper and Pulp Association is actively cooperating through the exchange of statistics and other measures with the Southern Kraft Association and the Paperboard Industries Association. In each case it has been found that there are many items of mutual interest and value which are common to the other two associations as well as the American Paper and Pulp Association and as a result the material now being received by the American Paper and Pulp Association is much more complete than heretofore and in addition, the other associations above mentioned are receiving from the American Paper and Pulp Association data which are in a measure some guide to them in their operations.

Arrangements have been made with the Survey of Current Business at Washington and the Paperboard Industries Association whereby the American Paper and Pulp Association will receive each month from those two groups the data in

total as received by them from the paper board mills and in addition, the American Paper and Pulp Association will attempt to receive from some 50 other paper board mills their monthly production, shipments, stock and paper stock figures which in turn will be totaled and added to the figures as received from the Survey of Current Business and the Paperboard Industries Association and the complete total for the industry published.

For those mills which are co-operating in this measure with the American Paper and Pulp Association there is being arranged an exchange agreement without any obligation attached thereto whereby such mills will receive in exchange for their mill figures the totals as reported for the industry. This in itself should prove very helpful toward the stabilization of the board industry, particularly since the industry will be better equipped to handle its affairs by having a more complete picture of current statistics than it has had heretofore.

This co-operation combined with that of the Survey of Current Business and the Paperboard Industries Association is a step along the lines of progressive work being established by the Association.

Association Secretaries Seek New Fields

Dr. Hugh P. Baker has chosen to resign as executive secretary of the American Paper and Pulp Association in order to take charge of a new department of the Chamber of Commerce of the United States, a department which will be concerned in co-ordinating the activities of trade associations throughout the country with those of the United States Chamber of Commerce. This interesting piece of news was given out by Doctor Baker at the usual weekly meeting of paper industry periodicals with the executive staff of the American Paper and Pulp Association and affiliated associations on Monday, November 14. On the following day R. S. Kellogg, secretary of the News Print Service Bureau, announced that William G. MacNaughton had given up his connection as secretary of the Technical Association of the Pulp and Paper Industry to join the staff of the News Print Service Bureau "as Engineer and all-round technical assistant."

Hugh P. Baker, who is a Master of Forestry of Yale and a Doctor of Economics of Munich, was the dean of the New York State College of Forestry at Syracuse University when he was persuaded by President George W. Sisson, Jr., in the spring of 1920, to take the secretaryship of the American Paper and Pulp Association. Having been identified with forestry work ever since he was graduated from college—he was for ten years with the United States Forest Service before organizing departments of forestry at the Iowa and Pennsylvania State Colleges—he took an active interest in forestry associations and was always a welcome speaker at the annual gatherings of these bodies. Through his connection with the Empire State Forest Products Association he became well and favorably known to pulp and paper manufacturers in the Eastern States. It was therefore quite in the logic of events that he should come to be identified with the work of the American Paper and Pulp Association, which was then beginning to pay increased attention to the practice of forestry with a view of assuring adequate future supplies of pulpwood at a minimum cost. The fact that the American Paper and Pulp Association has during the past seven years become recognized throughout the country as the central national organization of the paper industry of the United States may be ascribed quite properly to Doctor Baker's abilities as an organizer, tactful leader and public speaker.

In discussing with the representatives of the paper industry press the subject of the severance of his relations with the American Paper and Pulp Association, Doctor Baker intimated that he was prompted to go with the United States Chamber of Commerce because of the opportunities which the new post offered for greater service to trade associations generally, rather than by any question of increased emoluments. In his new post, he said it would be his aim to develop trade association work to its fullest possibilities without any attempt to play the game of individual associations. It would rather be his endeavor, he said, to show how they could be made of greater service to the industries which they represented. He also improved the opportunity to say a word in praise of the work of the paper industry periodicals, his contact with which had been most helpful to him in his work as executive secretary of the American Paper and Pulp Association. He bespoke the same measure of support for his successor and expressed the hope that Oliver M. Porter, who has been the association's assistant secretary for several years past, and is thoroughly familiar with its work, would be chosen to succeed him.

As secretary of the Technical Association of the Pulp and Paper Industry to fill the unexpired term of Mr. MacNaughton, the executive committee of that association has appointed Ronald G. Macdonald, a member of T. A. P. P. I., who was educated at Massachusetts Institute of Technology, where he took his B.S. degree in 1922, and who continued his technical training by taking an apprentice course in papermaking in the mill of the Pejepscot Paper Company, serving subsequently on the research staff of the Oxford Paper Company under Professor McKee. At the time a successor to Mr. MacNaughton was under consideration, Mr. Macdonald was engaged in work on **Chemical and Metallurgical Engineering**, a McGraw-Hill publication. That the association will ratify the tentative choice of its executive committee seems well assured, the committee having made an admirable selection in naming Mr. Macdonald, a young man of agreeable personality, who is well grounded in the fundamentals of pulp and paper technology.

News Print Bureau Changes Engineers

George D. Bearce, for the past seven and a half years engineer in the News Print Service Bureau, is now connected with the manufacturing department of the International Paper Company, with offices at 100 East Forty-second Street, New York. His place in the News Print Service Bureau has been taken by William G. MacNaughton, formerly secretary of the Technical Association of the Pulp and Paper Industry.

In a statement to members of the News Print Service Bureau, issued on November 15, R. S. Kellogg, secretary, says in part:

"The services of Mr. Bearce to the news print industry have been many and varied. More especially, the methods worked out by him for checking and comparing the operating efficiencies of paper machines and steam plants have been widely used; while as chairman of the committees on Waste and Handling Materials of the Technical Association, his annual reports have been of most practical and helpful character.

"Prior to his assumption of the duties of secretary of the Technical Association, Mr. MacNaughton had a wide experience in paper mills in the United States and Canada, ranging from the chemical laboratory to plant management. Under his leadership, the Technical Association has grown notably in numbers and greatly extended its services to all branches of the paper industry in North America, together with helpful co-operation with similar organizations in other countries. The executive committee of the Technical Association can be depended upon to see to it that there is no slackening in the work of that excellent organization.

"The association of Mr. MacNaughton with the personnel of the News Print Service Bureau means a continuance of the everyday, detailed practical engineering service to the manufacturers of news print paper which they have had so steadily in the past."

Annual Essay Contest

A most commendable educational movement is being sponsored by Alvin T. Simonds, president of the Simonds Saw and Steel Co., Fitchburg, Mass.

Mr. Simonds has for several years offered an annual prize of $1500, divided in three parts, for essays written on popular economic subjects. He believes this will assist in advancing the study of economics in schools and in general throughout the country.

The Month at Washington

THE time is at hand when the 70th Congress opens its doors. By the time this issue reaches you the gavel will have fallen and the curtain risen on the Congressional enactments of the first and long session of the 70th Congress. Readers of these columns will be kept in close touch with all pending or new legislation affecting the paper industry.

The first legislative measure on the calendar is the deficiency appropriation bill, followed by the tax revenue bill, which will keep Congress busy until the Christmas holidays. However, a number of bills will be introduced in the interim by members of both houses, affecting business in various ways, but will not be acted upon until sometime in January or later. A complete summary of those measures which affect the paper industry will appear in a later issue.

All bills and resolutions not acted upon finally by the last Congress in either house, will have to be reintroduced at this session in order to receive consideration. The total number of bills and resolutions introduced in the house during the last Congress was 18,312 and the grand total of laws enacted was 6,948, of which 5,192 originated in the House of Representatives and 1,756 in the Senate Chamber.

The most important piece of legislation before Congress is the new revenue law and its attending tax reduction program. The bill as drafted for the consideration of Congress by the Ways and Means Committee, shows a cut in the corporation tax from 13½ to 11½ per cent, and raises the exemption of small corporations from two to three thousand dollars, with a reduction in the automobile sales tax from 3 to 1½ per cent; the club dues tax is reduced by one-half, and the transfer tax on shares of capital stock from 2c to 1c. No change is made in the intermediate brackets of the individual income taxes. The stamp tax is retained in toto as it has been in the past. Although the question of evasion of surtaxes by corporations was under consideration, no measures were introduced in the bill to curb this evil. But personal holding corporations are subjected to a tax of 25 per cent on their net income if they retain 30 per cent or more of their net income in any one taxable year. Deductions are authorized for dividends actually declared during the year and for Federal income taxes. A personal holding corporation is defined as one in which 80 per cent of the voting stock is owned directly or indirectly by 10 individuals or less. In framing this piece of legislation, the Ways and Means Committee heard representatives of many different lines of business activity and of large national organizations of commercial interests, who voiced their views as to what Congress should do in reducing the Nation's tax burdens.

Trade Promotion Activity—The annual report of the Bureau of Foreign and Domestic Commerce estimates that actual orders were obtained, and specific losses avoided, for American business institutions amounting to 500 million last year, through the trade promotion services of the Bureau, covering a wide range of commodities. This service is pointed out as one which gives the business man, as a taxpayer, ample opportunity for collecting substantial dividends on his investment in this governmental organization. That the American business man is beginning to take more advantage of this service to an ever increasing degree, is evidenced by the progressively increasing number of trade-promotion services now being rendered by the Bureau. Every paper manufacturer should get a copy of this report.

Census Bureau Valuable Source of Information—More than 48,000 inquiry letters were received during the last fiscal year by the Census Bureau from American business men, who use the statistical information gathered by the government, says the annual report of the Bureau. The U. S. ranks first as a compiler of statistics, its data covering practically every phase of our business life. The report outlines the work of the Bureau, including its work on the census of manufacturers and its more recent census of the distribution of commodities. The Bureau handled over 16 million reports from its census takers during the year. Some 2,235 machines are employed in handling this statistical work. A copy of this report should be on every paper manufacturer's desk for reference.

Bureau of Standards Has Aided Business—Indicating the extent to which science has been applied to industry in the solution of technical and business problems, is the fact that nearly half of the 150,000 tests completed by the Bureau of Standards during the last fiscal year were made for industries and individuals, according to the annual report just issued. The number of tests made by the Bureau has doubled in the last 5 years. Simplified practice recommendations for 62 commodities were issued. Here is another reference work that should be on your desk.

Helping Business To Help Itself—This is the new policy of the Federal Trade Commission as shown in its annual report, just issued, which has shown far-reaching results. Trade practice conferences, granting informal hearings before complaints are issued, and settlement of cases by stipulation, are pointed out as three constructive agencies which have materially aided business. The report reviews the policies and procedure of the Commission, and in order to arrive at a better understanding of the workings of the Commission, every paper manufacturer should procure a copy of this annual report for file.

Wages Paid in Industry—The Secretary of Labor has just issued his annual report which indicates among other things that low wage paying employers are a parasite on the community, and that credit is due the vast army of American employers who in general have seen good business resulting from paying good wages, in full confidence that they could count on maximum output from their employees. "It is sometimes argued," report says, "that wages must be reduced if we are to increase the sale of our goods in foreign markets. The answer is that by such wage reductions we reduce our profitable home market far more than we increase the less certain profits of the foreign market. No matter on what plea or excuse, reduction of wages is bad business and worse economics, whether applied to a given industry or in the broader social sense." Here is another report worthy of having in your library.

Court Decisions Affecting Labor—A review of the decisions of the courts and of the legal opinions affecting labor during the year is contained in Bulletin 444, just issued by the Bureau of Labor Statistics. Workmen's compensation continues to afford the most fruitful source of material, the courts being still called upon in numerous instances to give construction to this recently adopted form of state legislation. That employer's liability is not entirely superseded thereby is evident from the considerable number of cases still arising under this system.

Simplified Practice Growing—About 80 per cent of those who adopt simplified practice recommendations, strictly adhere to their program, says the Department of Commerce. This economic movement is announced as one of the most significant of the present day, and is now firmly established in this country as a fundamental of good business management. There are at present 75 actual simplified practice recommendations in existence in manufacturing, selling and purchasing of commodities, to which many individual firms and companies have pledged their support. The objective of adopting simplified practice is:

(1)—More economical manufacture through less idle equip-

ment, better scheduling of work, accurate cost accounting, long runs on large units; simplified packing, simplified material inventory and reduced cost per unit.

(2)—More efficient labor through less seasonal employment fluctuations, increased individual output, greater skill of workmen, ease of training employees, simpler and better inspection, smaller labor turnover and greater earning power.

(3)—Less capital tied up in raw materials, special mechanical equipment, semi-finished stock, finished stock, storage space and repair parts.

Propose To Reform Calendar—Plans for a reform of the calendar which would obviate defects of the present Gregorian calendar were presented to the War and Navy Departments, State and Agricultural Departments, by Moses B. Cotsworth, expert to the League of Nations Committee on Calendar Reform. Two alternative plans were offered, "B" and "C," the first of which would equalize the 4 quarters of the year by months each of 30 and 31 days, with 8 months of 30 days and 4 months of 31 days. Plan C provides for a fixed calendar of 28-day months and would divide the year into 13 months, each comprising 4 complete weeks, beginning on Sunday and ending on Saturday. Special advantages would accrue to business by this calendar, since both day and date could be recorded on time-clock and watch dials, and the complete 4 weeks would harmonize weekly wages and expenses, monthly rents, accounts, etc. Pay-days would recur on the same monthly dates. Monthly work, payments, production, etc., would recur on four fixed monthly dates. Fractions of weeks and months-end would cease. A great amount of clerical work would be eliminated in preparing accounting and statistical reports. Interest calculations would be simplified. There would be a faster turnover of money and stock, with less inventory to carry, since 28-day months would bring quicker settlements of accounts, thus enabling the same volume of business to be handled with less capital. All holidays would be placed on Monday to add to the week-end advantage of both industry and labor.

Largest Resources in History Reported—A new high record in total resources of national banks in the U. S. was recorded last month, viz.: $27,213,874,000. This strength of the national banking system is attributed largely to the McFadden National Banking legislation enacted at the last Congress.

Methods to Encourage Thrift in Industry—Various expedients are being used by the industrial establishments of the country to encourage thrift among their employees, says the Department of Labor in a recent report, based upon a survey of 430 concerns, of which 196 companies make a concerted effort to induce their employees to put something in the bank each pay-day. A total of 29 concerns reported the use of building and loan associations or some form of financial assistance in building and buying homes. Approximately two-thirds of the concerns reported that their employees are privileged to come to them for free legal advice, and in many instances advice as to investments and expenditures is given. Co-operative buying and discounts on company goods were reported by 21 companies. Approximately 50 concerns reported plans by which employees shared in their profits, while 123 companies reported a special plan for the sale of stock to employees.

Standards for Check and Draft Paper Sizes—Simplified Practice Recommendation No. 50, just issued, reaffirms, without change, the practice of having uniform sizes for checks, notes, drafts and similar bank instruments; also the use of window envelopes and the products of commercial manufacturers, with a view to having one size suitable for transmitting standard commercial instruments, including not only bank checks, drafts and notes, but inquiry, purchase orders and simplified invoice forms. The committee on standardization believes that all requirements will be met by envelopes 3⅝x 8⅝ inches with a 1¼x5-inch window, located ¾ inches from the left-hand end, and ⅞ inches from the bottom of the envelope. By these changes, many forms are reduced for each document, with a standard check form for use by everybody and discouraging the use of a number of non-standard sizes.

French Tariff Controversy Brought to Close—The controversy between the U. S. and France over the question of tariff rates, has been brought to a formal close. Orders withdrawing the increased import duties levied against certain French products in retaliation for duty increases by France on like American products, have been sent to all collectors of customs. These orders automatically restore the original schedules of rates. French discriminatory tariff rates against imports of certain goods from the U. S., in effect since Sept. 6th last, were also removed, and the old rates restored. Thus ends a tariff war between these two countries, which demonstrates the power of American business interests both at home and abroad, and that no foreign power can afford to discriminate against American goods today and get away with it.

Trade Exposition at Seville—Manufacturers of the U. S. have an opportunity to reach not only the markets of Spain, but also many representatives of the 60 million residents of South America, by exhibiting at the International Exposition at Seville in 1928. It is the common practice among merchants and manufacturers of South America to spend the winter and early spring in Spain, at which time the exposition will be in progress at the height of their season there. The exposition opens on Columbus Day, Oct. 12, 1928, and a special U. S. building will be provided for the exhibit.

New England Industrial Survey Completed—New England's industrial importance, trade and marketing channels and commodity movements, as well as other factors in its economic life, will be portrayed in a series of pamphlets, maps and graphic charts prepared by the Department of Commerce about to be issued, depicting the results of a commercial survey of New England.

More Efficient Distribution—The science of commodity distribution has failed to keep pace with improved manufacturing methods, says the Bureau of Foreign and Domestic Commerce, which claims that millions are being squandered in inefficient selling methods. The big job before the government is to work with business in considering the many vitally important problems of distribution efficiency, and in attacking them with more modern weapons of scientific analysis, so that maximum benefits may accrue to the consumer as well as to the producer and distributor.

Planning Salesmen's Territories—This is the title of Trade Information Bulletin No. 314, issued by the Department of Commerce, giving the results of a study of the elimination of waste in sales territories. Another interesting publication is No. 15, "The Merchandise Warehouse in Distribution," or a study of the services and best practice in present-day merchandise warehouse distribution.

"Retail Prices, 1890-1926" is the title of Bulletin No. 445, published by the Bureau of Labor Statistics.

More Fires in Winter than in Summer—Analysis of fire prevention by the Bureau of Standards, with tabulations of monthly fire losses in the U. S. and Canada, individually and collectively, over periods of 5 to 10 years, shows that fire departments are called out to fight a greater number of fires throughout the winter months than during the remainder of the year. The number of fires and the corresponding amount of losses reach high peaks during the periods when heating plants are in operation. The majority of these fires show them due to strictly preventable causes.

U. S. Conciliation Service—In a report for the fiscal year 1927 the Bureau of Labor Statistics shows important work by the U. S. Conciliation Service, showing that 545 trade disputes were handled by representatives of this service, of which 24 were still pending at the close of the year, 436 cases were adjusted, and 69 cases closed without assistance, and 57 disputes were listed as "unable to adjust." Cases presented for settlement during the year directly or indirectly affected 575,723 workers. Official experience shows that in approximately 85 per cent of the cases submitted, satisfactory settlements are procured, even though the commissioners have no power to compel contesting parties to accept mediation, or authority to make awards or decide issues in dispute. Their duties are simply to negotiate, advise, and counsel with management and men with a view to bringing about industrial peace upon the best possible basis for all concerned.

Mellon Predicts Continued Prosperity—The Secretary of the Treasury sees no factor in the present economic situation

that should lead to a business depression, and declared that present conditions were most favorable for a continuation of satisfactory business conditions for 1928.

Highest Standard of Living Set By Us—The American people had a record aggregate national income of nearly ninety billion last year, says the Bureau of Internal Revenue. This shows the highest standard of living ever attained in this or any other country. The total income shows an increase of 43 per cent over 1921. The increase is shown in the following table:

YEAR	TOTAL (In Millions)	PER PERSON
1921	$62,736	$1,537
1922	65,567	1,586
1923	76,769	1,821
1924	79,365	1,840
1925	86,461	1,971
1926	89,682	2,010

Recent Income Tax Rulings—If you want to make deductions for expenses for maintaining and repairing automobiles used in business, or the salary of a chauffeur for services rendered in the course of business, or for traveling expenses incurred in the course of business, it is necessary that you produce the proper evidence which entitles you to the deduction, says the Board of Tax Appeals (Harold Vauer, Docket 8579).

Undrawn additional salaries and interest thereon, credited in any taxable year, even though only after informal conferences of directors, may nevertheless be deducted from gross income as ordinary and necessary business expense for income tax purposes, says the Board in another decision (O. H. VanHorn Co., 8252).

To the same effect M. Cohn & Sons Co. (No. 7361-9238), to deduct from gross income for any taxable year the reasonable salaries and compensation of officers and employees, whether or not the same were actually withdrawn by such officers and employees.

Withdrawals by stockholders, representing totals of balances of withdrawals from surplus earnings, are to be considered in the nature of dividends or distribution of profit, and may not be added to invested capital, says the Board in another ruling (Greenfield Bros. Co., No. 6912).

The expense of physically moving machinery from one location to a new location was held not to constitute an improvement or capital expenditure, but rather as an ordinary and necessary business expense, in MacAdam & Foster, Inc., No. 10,443.

Employment and Payroll Totals—The employment and payroll totals in manufacturing industries, including paper for the month of October, contrasted, is shown in the following table; using 1923 as the monthly average of 100, viz:

	Employment			Pay-roll totals		
	1926	1927		1926	1927	
	Oct.	Sept.	Oct.	Oct.	Sept.	Oct.
Paper and pulp	96.2	93.3	93.3	104.5	96.7	99.6
Paper boxes	105.6	99.6	102.9	118.2	110.8	117.6

Outstanding increases in employment, aggregating 5 per cent increase, occurred in the paper box industries, confectionery, flour, shirts, etc., also showing increased pay-roll totals.

Recent Customs Decisions—Paper classified at 5c per lb. and 15 per cent ad valorem, and at 4½c a pound and 17 per cent ad valorem, by the collector, was claimed dutiable at 4½c under par. 1305 by Borden & Riley Paper Co., and the contention was upheld by the U. S. Customs Court as surface coated decorated paper (217428-G).

Certain merchandise classified at 35 per cent ad valorem under par. 1313 as manufactures of paper, was claimed dutiable at 25 per cent under par. 1303 as manufactures of pulp by Schleigher & Schull, and the contention was upheld (218423-G) on certain extraction shells, filter paper, thimbles and diffusion shells.

So-called compressed hard paper wrapping bobbins, classified as manufactures of paper at 35 per cent ad valorem under par. 1313, were claimed dutiable by J. I. Bernitz et al at 25 per cent under par. 1303, but the court overruled the protest, holding them properly classified by the collector(163032-G).

Interstate Commerce Rulings—The Interstate Commerce Commission has suspended from Nov. 15th to June 15, 1928, the operation of certain schedules which propose increases and reductions in rates on paper and part articles, less carloads, from Virginia cities, eastern and interior eastern points to Carolina and south-eastern points (I & S Docket 3007).

The Commission in a recent decision held that the establishment of an interstate rate of 38.5 cents per 100 pounds on import and coastwise shipments of newsprint paper from Lake Charles, La., to Shreveport, La., was justified insofar as it would effect a reduction from the present fifth class rate over the Kansas City Southern, but not justified where effecting an increase in rates over other lines, and accordingly entered an order in I & S Docket No. 2966 cancelling the proposed rates without prejudice to filing new schedules in conformity with its findings.

"Forests & Water"—This is the title of a booklet just issued by the Department of Agriculture, giving the results of years of scientific investigations by noted men both in America and in many other countries.

The Career of Eugen Meurer

The passing of Eugen Meurer, founder and former president of the Central Paper Company, Muskegon, Mich., is the subject of many sympathetic notices and tributes in the German paper industry press, as he was a native of Germany, having first seen the light in Aalen, Würtemberg, January 20, 1861, though he spent part of his youth in Weinsberg. He was educated at Stuttgart High School, and when his studies terminated he gained practical experience in the construction of papermaking machinery at the works of J. M. Voith, Heidenheim-on-the-Brenz. He later became connected with pulp and paper manufacturing firms in Germany, notably the pulp mill of Groditz, of Kiebler & Niethammer, and the Ritschen paper mill.

When 28 years old, in December, 1889, Mr. Meurer left Germany and came to the United States, where he was first engaged as pulp expert with the Hudson River Pulp & Paper Company. He then formed a connection with A. Pagenstecher, sr., and built for him at Palmer Falls, N. Y., the first successful sulphite pulp mill in the United States. Four years later, in 1894, Mr. Meurer was employed by the Laurentide Company to build a sulphite mill at Grand' Mére, Quebec. After this had been in operation about a year, Mr. Meurer, in association with the elder Mr. Pagenstecher, conceived the idea of forming a pulp and paper company of his own, and plans were drawn for a plant at Muskegon, Mich., which was operated as the Central Paper Company. Production was begun in 1900, and the management of the plant, which represented an investment of approximately $500,000, became his life work. The business grew, new units being added from time to time, including what is believed to be the first sulphate paper mill in the United States, until today the production amounts to 120 tons daily of sulphite and kraft wrapping papers.

Mr. Meurer was an inventor of some note and took out several patents covering improvements in cooking processes, and in the form of digesters. With A. Pagenstecher, jr., he organized the Non Antem Sulphite Digester Company for the sale of patented digesters.

Mr. Meurer never fully recovered from the result of internal injuries sustained in an automobile accident last May, and in August he returned to Germany to seek health in the homeland, but he was too late and he passed away on Monday, October 24, in Ulm, Würtemberg, surrounded by members of his family, including his wife and two daughters, Mrs. Walter Voith, of St. Polten, Austria, and Mrs. Hans Voith, of Heidenheim, Würtemberg.

That Santa Claus should find his way to the Christmas tree by the aid of moonlight, not moonshine, is the belief of the National Safety Council.

How to cut down clay consumption

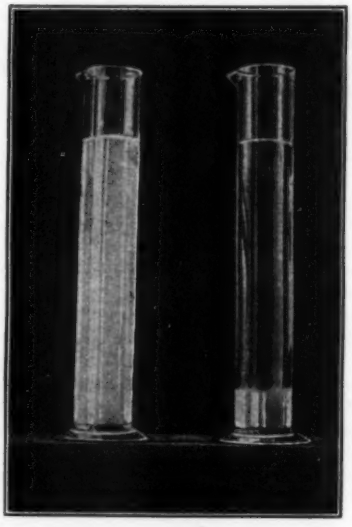
The DORR SAVE-ALL will recover the fibre and filler from your white water flow.

The Dorr Save-All, by the very nature of its design, appeals particularly to paper men who are making a sheet with a high clay-content. Dorrs recover from the white water not only the fibre, but the valuable filler which is so finely-divided that it is usually lost.

Definite figures on the operation of Dorr Save-Alls at one plant show that clay furnish per beater has been cut down from 500 lbs. to 300 lbs. and water consumption reduced 60%. And incidentally, the matter of stream pollution has ceased to be a problem.

Send for booklet "How you can turn your White Water Waste into profit."

DORRCO



***TRY THIS**—Fill a glass cylinder or jar with a sample of your white water and let it settle. You may be surprised at the amount of stock that settles out. This simple test will give you an idea of what a Dorr can do for you.*

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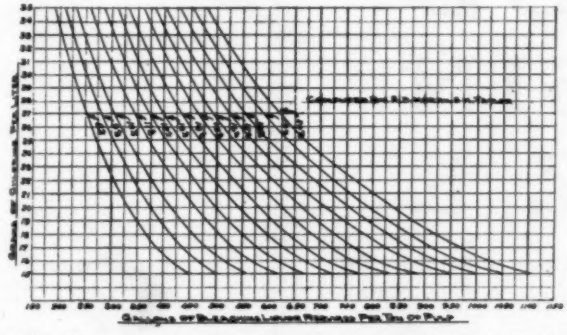
INVESTIGATION TESTS DESIGN EQUIPMENT

Practical Helps for the Mill Man

Bleach Consumption Curves

CHEMICAL pulp mill operators are now commonly producing pulps for bleaching with the desire to perform the bleaching operation as economically as possible. By means of a standard test, the technologist determines before the bleaching operation is begun the percentage of bleach required. This information given to the operator in charge



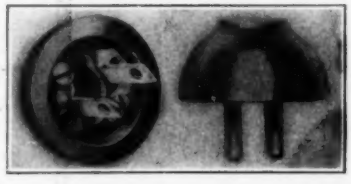
of bleaching permits him through the use of the following chart and a knowledge of the weight of pulp to be bleached to ascertain easily the number of gallons of bleach liquor of a given concentration to be used for bleaching.

Chart for Determination of Weight of Calender Roll

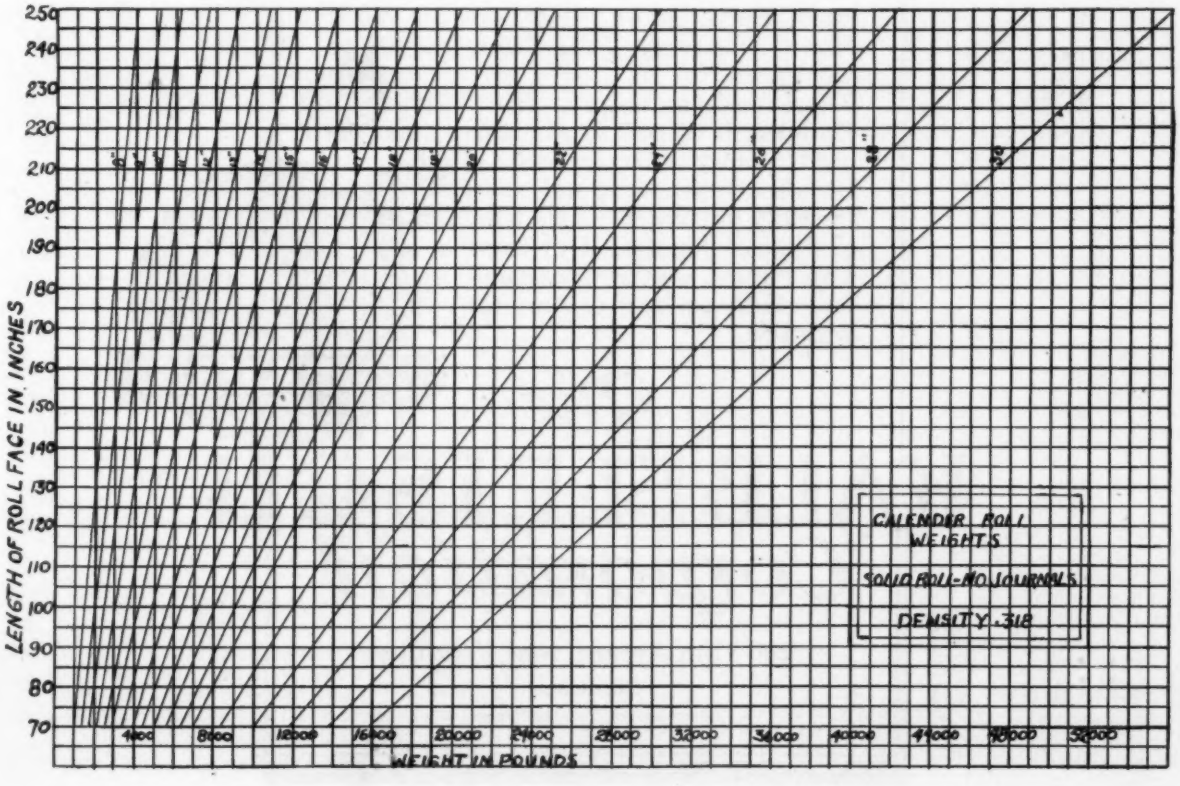
IT is often of advantage in the handling of calender rolls to have some handy method for the determination of the approximate weight of such rolls. The following chart is arranged to include rolls from 8 inches to 30 inches in diameter and from 70 inches to 250 inches across the face. To ascertain the weight of a roll, exclusive of the journals, it is simply necessary to locate on the chart the point where the line representing the roll face crosses the graph for the given diameter roll, and then from this point vertically downward to read the weight of the roll in pounds. For example: A 28 inch diameter roll with a 210 inch face weighs approximately 41,000 pounds.

New Unbreakable Plug

A new type of unbreakable attachment plug made of rubber is announced by The Cutler-Hammer Mfg. Co., Milwaukee, Wisconsin. This rubber plug should be of interest to users of small motor driven tools as well as other users of other electrical appliances because impact on cement or wood floors will not harm the plug or the floor.



The plug is made of a high grade of rubber and is very light in weight. The terminals are fastened in a Bakelite strip firmly embedded in the rubber base. Rivet and anchor construction holds the terminals to the Bakelite and keeps them from turning. Staked screws prevent loss and save time in wiring.



CONSIDER the advantages of WOOD ROSIN SIZE

The use of Wood Rosin Size for unbleached stocks is a thrifty and recommended practice.

From the standpoint of effectiveness this size is fully the equal of the commoner grades of gum size. Where lightness or whiteness of color is not a factor Wood Rosin Size is completely satisfactory.

From the *price* viewpoint Wood Rosin Size is far superior. The cost is appreciably lower than for the expensive gum sizes. Furthermore, quotations on Wood Rosin Size vary little from month to month.

These advantages are offered in Kalbfleisch Wood Rosin Size *plus* the high quality characteristic of all Kalbfleisch products and service. Possibly you could take advantage of these economies. Our Service Department is at your call and will gladly go over this matter with you.

for PAPER

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BRITISH CORRESPONDENCE

Paper Trade Conditions

Paper consumption of all sorts has been increased by the approach of the Christmas shopping season. Both printers and merchants are finding business better than it has been for some months, and, in several other directions, trade is more satisfactory. But, despite the improvements in home consumption, this alone is by no means sufficient to keep the industry going, and it is an unfortunate fact that export figures have gone down considerably, although imports have increased. The manufacturers are still dissatisfied with the amount of foreign woodfree paper and newsprint which comes into the country.

Canadian Developments Being Watched—The efforts of Canada to increase her Australian and New Zealand exports, and thus to maintain her lead in newsprint production and keep her new installations fully employed, is reacting to the disadvantage of the British manufacturers, and British firms have to reconcile themselves to slightly less tonnage of paper for these countries than they have been used to in the past.

Developments in Canada are being closely watched on this side, and the Times Trade Supplement, commenting on the subject, points out that the statement of Mr. A. R. Graustein, president of the International Paper Co., that "Canada has the world by the tail in so far as the newsprint industry is concerned," is indicative of the growing realization of the importance and possibilities of this great industry in the Dominion.

British manufacturers are showing particular interest in the recent Canadian paper trade mergers; in particular that of the Spanish River Pulp and Paper Mills, and the Abitibi Power and Paper Co., Ltd., and several subsidiaries of these two companies, which has created a new organization which will be the world's largest newsprint paper manufacturing concern, with a total daily rated capacity of approximately 2,200 tons of newsprint, equivalent to about one-third of the aggregate capacity of all the newsprint mills in the Dominion; while the election of the president of Price, Brothers & Co., Ltd., and the president of Spanish Pulp and Paper Mills, Ltd., to the board of directors of Fraser Bros., Ltd., suggests the probability of closer co-operation between these companies.

Demand and Prices Good—The newsprint section of the British paper trade has enjoyed better home demands and supplies of pulp have been abundant at favorable prices, and the fact that manufacturers have amply covered their forthcoming prices seems to be indicated by a slight hardening of prices.

Business has also improved in the esparto section; the home demands are satisfactory and export trade is good. Prices are favorable and supplies are satisfactory. Easier rates have been quoted for good makings. Scottish mills are turning out some particularly fine brands of esparto writing papers at the present time, and there is a marked tendency towards the increased use of branding and of publicity. The chaotic conditions which still characterize distribution and selling, however, make a full use of publicity impossible at present.

More active demands have been evidenced in the woodfree mills, and home manufacturers are holding their own in spite of foreign competition. In both the wood pulp and esparto markets, however, prices are still low, although there are signs of an improved tone. Quotations may harden in the near future in the chemical wood pulp section. Much the same condition of affairs exists in the mechanical wood pulp section, although spot orders are being executed at favorable rates. In kraft pulp, there are also similar tendencies.

A new joint selling organization has been established for mechanical pulp, in the form of an agency which represents the majority of the larger Swedish producers of moist mechanical pulp. This concern has headquarters at Stockholm, Sweden, and came into being at the end of October.

Paper Industry Developing in Australia—British manufacturers are faced with another menace in the Australian market by the fact that a determined effort is being made to establish a papermaking industry in that country, using as a raw material pulp made from the native grown wood of the eucalyptus type. There are rumors to the effect that the preference given to Canada on paper imports may be withdrawn, because Great Britain is in a better position to reciprocate by buying largely of the products that Australia has in abundance, which Canada is not in a position to do, for she exports a similar class of goods to those produced by Australia.

As far as prospects for Australian maufacture are concerned, it has been pointed out that Australia has some very fine forests of hardwood of the eucalyptus type, and, for many years, it was thought that it was impossible to do anything in the way of making paper from this material; but the Council of Industrial and Scientific Research have had the matter in hand, and they have in their laboratories been able successfully to pulp by chemical process one of the eucalyptus group—the brown stringybark, with the result that, whereas a cord of spruce or balsam fir yields 1,000 lbs., they have been able to produce 1,800 lbs., from a similar quantity of the stringybark, and, when experimenting with blue gum, the yield was 2,000 lbs. to 2,200 lbs., or twice that of spruce fir. Another item in favor of the Australian woods is that the growth is so much more rapid than in the colder climate of the northern hemisphere—about four times as quick—so that the matter of reforestation would seem to be an easy and workable proposition.

Discussing the subject, a paper trade authority in this country states: "The nature of the pulp when made is rather different from that now in use, the fiber of the hardwood pulp made by the chemical process being much shorter than that made from spruce fir. On account of this, and for other reasons of a purely technical nature, it is recommended that the furnish for newsprint should be 70 per cent chemical, and 30 per cent mechanical, instead of 75 per cent mechanical and 25 per cent chemical as with us. Allowing for this and all possible working expenses, it is estimated that the cost of production would fall sufficiently below the present import price to make home manufacture a very workable and paying proposition, and, as the Australian Government is willing to grant a bonus of £4 on newsprint produced from native raw materials, and also a duty of a similar amount, deferred until the industry is producing a substantial proportion of the country's requirements, it seems probable that the next few years will see a start to establish the papermaking industry in the Commonwealth on a sound basis."

Imports and Export Figures

Below are set out the values of the various paper trade products imported and exported in October, together with the increases or decreases as compared with the increases or decreases as compared with the corresponding month of the two preceding years:—

Quantities of the same materials exported:

	October 1927	Inc. (+) or Dec. (−) as compared with 1926.	Inc. (+) or Dec. (−) as compared with 1925.
IMPORTS			
Paper-making Materials	1,077,633	+200,636	+174,964
Paper and Cardboard	1,594,916	+312,516	+140,298

Quantities of the same articles imported:

	Oct., 1925	Oct., 1926	Oct., 1927.
Wood-pulp, tons	101,327	93.253	126,392
Paper, cwt.	1,423,177	1,312,062	1,707,145

	October 1927	Inc. (+) or Dec. (−) as compared with 1926.	Inc. (+) or Dec. (−) as compared with 1925.
EXPORTS			
Paper-making Materials	124,848	−23,733	−19,875
Paper and Cardboard	846,388	−108,765	

Quantities of the same materials exported :

	Oct., 1925.	Oct., 1926.	Oct., 1927.
Paper and Cardboard cwt.	506,693	462,733	393.7
Paper-making materials, tons	13,599	16,158	16,963

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I. P. Morris and Pelton Hydraulic Turbines and Accessories.

Modern High Speed Newsprint Machines embodying the following Special Features:

Van de Carr Slices.

Oscillating Suction Boxes.

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Suction Couch Rolls (Millspaugh Type)

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Special Mechanism for driving Dryers, assuring safe running at high speeds.

P 27

DOMINION ENGINEERING WORKS LIMITED

MONTREAL · CANADA

Canadian News

Change Asked in Paper Tariff

An important application was made to the Tariff Advisory Board at Ottawa, recently, when George F. Chipman, manager of the Grain Growers' Guide, Winnipeg, asked for a 99 per cent drawback on duty on certain imported articles entering into the production of magazines and farm journals. It also requested that these articles be exempt from sales tax. Ninety-nine per cent drawback on the present duty was requested on paper for magazines, envelopes, electrotypes, engraving, printing ink, and printing presses other than newspaper presses which are already on the free list. Mr. Chipman submitted that prices of magazine paper were much higher in Canada than in the United States, and filed exhibits in support of his contention. He claimed farm journals were greatly handicapped by the duty on their raw material, having to face open competition from the United States and Great Britain. He also complained of the cost of ink, envelopes, electrotypes, and printing machinery, due, in his opinion, to the tariff on these articles.

John Atkins, representing the Canadian National Newspaper and Periodical Ass'n, supported the application, believing it would lead to the greater development of magazine production and would not injure paper production. He said the magazine trade had attempted to secure protection through a duty on the advertising content of imported magazines, but had failed, and now had but the recourse afforded in the present application to aid in developing this branch of the publication industry.

The application was opposed by Edward Beck, secretary of the Canadian Pulp and Paper Ass'n, as it referred to newsprint of all grades and also bond papers. He pointed out that the Canadian pulp and paper industry represents an investment of over $500,000,000, while the value of its products in 1926 was close to $225,000,000, and it gives employment to 60,000 people.

Protests were also filed by the Canadian Paper Trade Ass'n, Canadian Bureau of Envelope Manufacturers, Printing Ink Manufacturers' Ass'n, Photo Engravers' Ass'n, Electrotypers' Ass'n, and the Canadian Business Publishers' Ass'n. The latter is a rival of the Canadian National Newspaper and Periodicals Ass'n. G. S. Archibald, representing it, urged the application be not granted as it impaired the protective system under which Canadian industry had been developed. He claimed the applicants could improve the business by adopting more modern business methods and equipment.

There will be another hearing on the application in January.

Newsprint Outlook Promising

The outlook regarding newsprint is always interesting, and has been made all the more so in Canada by reason of the increase in the number of mills, recent mergers and consolidated selling arrangements. Although the plants are not now working to capacity, the future augurs well and the prospects are more promising than they were a year ago. The mills have been running for some months at about 80 per cent of capacity, but the industry seems to have passed successfully through the critical period which resulted from very rapid expansion. Matters now seem to have been cleared up considerably and if there is no sharp decline in business in the United States, the status of the newsprint industry seems fairly well assured.

There is likelihood of the Canadian demand for this commodity increasing, as the Conservative party proposes to launch a chain of papers in cities in the various provinces; at Toronto, Halifax, Winnipeg, Regina, Calgary, Vancouver and Quebec. The Federal Press Ass'n, Ltd., has been granted a charter for this purpose and offices have been opened in the Metropolitan Bldg., Toronto. The papers will be issued weekly at first, and it is expected that they will later be published daily.

Some thirty officials of the International Paper Co. went to examine forest areas in the south and around Hamilton Inlet, in Labrador, with a view to possible acquisition by the company.

The Canadian Pulp and Paper Ass'n has engaged Mr. Louis Lemieux to undertake a special investigation of paper importations, with a view to determining the extent to which foreign papers are affecting the production and sale of Canadian-made paper. Importation of paper has already created difficulties for a number of Canadian paper makers. Mr. Lemieux is considered well qualified for this position, in view of his many years' connection with the paper industry. He was connected with the Ste. Anne Paper Co. during construction work, was four years with Becker and Co., of London, and was secretary-treasurer and manager of the Tidewater Paper Co.

QUEBEC

Quebec to Have Compensation Board

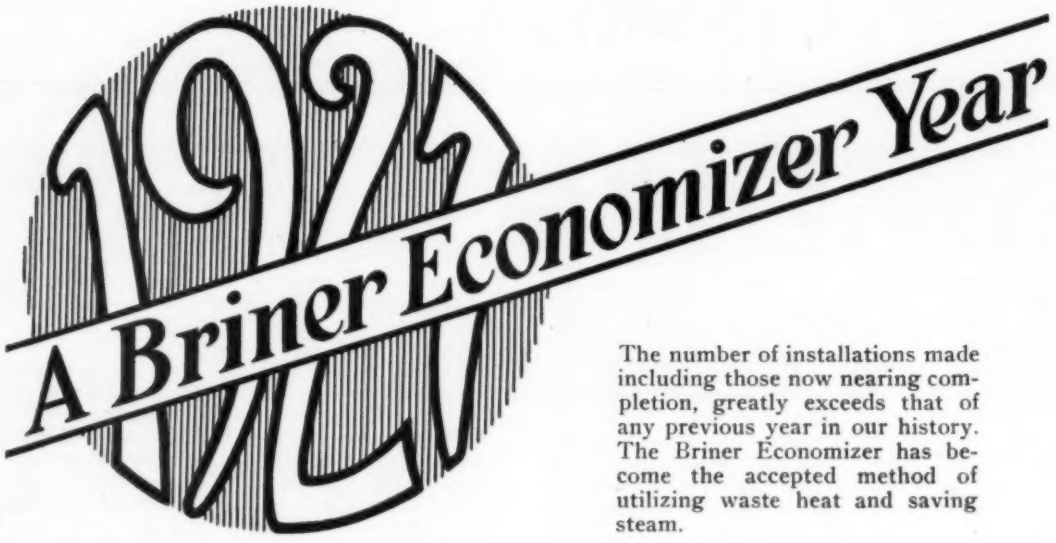
A commission to deal with compensation and indemnities to be awarded to workmen will be created at the next session of the Legislature, it is now understood. The commission will be quite similar to the Ontario body, which deals at present with such questions, with certain improvements in the system followed in the sister province.

It is rumored that the necessary legislation will be introduced at an early stage of the session, and it is admitted that already, law experts are preparing a draft of the projected legislation, which will be influenced by the report to be made later by Hon. Walter G. Mitchell and Louis G. Demers, the two attorneys appointed to study similar legislation in other provinces.

Alexander C. Morrison, of Quebec City, head of the lumber sales department of Price Bros. & Co., died suddenly on November 12, while on a visit to Price Bros.' Riverbend mill. The late Mr. Morrison was born in Glasgow, Scotland, 49 years ago. He was brought out to this country by the late Sir William Price as his private secretary in 1899, and he was the first stenographer the Price firm had ever employed.

For the purpose of centralizing the distribution and sale of power from the many small Gatineau Valley power plants it controls, the Gatineau Power Co., itself a subsidiary of Canadian International Paper Co., has formed a new subsidiary company. The new organization, known as the Gatineau Electric Light Co., opened its headquarters in Ottawa last month. J. S. Parker is manager of the concern. It will take care of the distribution and sales in connection with 15,600 horse-power being developed on the Gatineau and neighboring rivers.

Considerable interest has been expressed over the announcement in the Canada Gazette, of the formation of the Laurentide-Ottawa Co., Ltd., with a capitalization of 1,000 shares of no par value. This is naturally associated with the recent purchases of companies in the Ottawa Valley by the Lauren-



The number of installations made including those now nearing completion, greatly exceeds that of any previous year in our history. The Briner Economizer has become the accepted method of utilizing waste heat and saving steam.

Plans for 1928 Installation Now Being Made for Progressive Mills—Everywhere

Orders for installations early in 1928 are coming in from all sections of the industry in United States and Canada. These orders are for new mills being planned; new additions to mills previously equipped; and installations to equip mills now handicapped with excessive steam costs. The industry-wide endorsement of leading mill managers and engineers has made Briner Economizers standard equipment for every mill seeking efficient production. Consult us regarding requirements for your mill.

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tide Co. The announcement did not tell much as to the probable plans of Laurentide for financing the new venture, but the indication is that Laurentide will retain complete stock control, and finance any new developments it may decide to undertake through the issue of bonds.

To provide funds for the installation of the new machine it recently ordered from Dominion Engineering Works, and to reimburse the company for other expenditures on its properties, Howard Smith Paper Mills disposed of $900,000 of its 8 per cent preferred stock. The offering was made to the public at the price of 115, and brings the total amount of this security outstanding to $2,500,000, out of an authorization of $3,000,000.

Plans have been completed for the erection of an addition to the plant of Bishop & Sons, Ltd., Portneuf, manufacturers of paper roofing products. The bui'ding will be one story, 100 by 150 feet, of reinforced concrete construction, and will cost approximately $150,000. A large increase in output will thus be made possible.

In connection with the fibre-board mill, at present being erected in close proximity to the Gatineau newsprint mill of Canadian International Paper Co., by interests closely related to the latter organization, the International Fibre Board Co., was recently incorporated, with authorized capital of $3,325,-000, and head office in Ottawa. The company will also operate the fibre-insulating wallboard mill at Midland, Ont.

L. Thorngren, president, and G. Brolin, chief engineer. of the Karlstad Machinery Works, of Sweden, recently made a tour of a number of Canadian pulp and paper mills, and were entertained by Paper Machinery, Ltd., their Canadian representatives.

Paper Mills Spared by Floods

The unusual flood conditions that suddenly developed last month in some parts of Quebec, as well as in the New England States, caused some apprehension in paper mill circles. The Brompton Pulp and Paper Co.'s mills at Bromptonville and East Angus, in the heart of the flooded areas, however, escaped without damage. At Windsor Mills the flood was a record one, with nearly every town in the neighborhood isolated from every other, and several lives were lost. The Canada Paper Co. did not suffer any serious damage, and no wood was lost.

The Dominion Paper Co., at Kingsley Falls reports that only very slight damage was done by the floods due to banks washing away, but the mill was not damaged. It was not shut down at all, although backwater bothered for a couple of days.

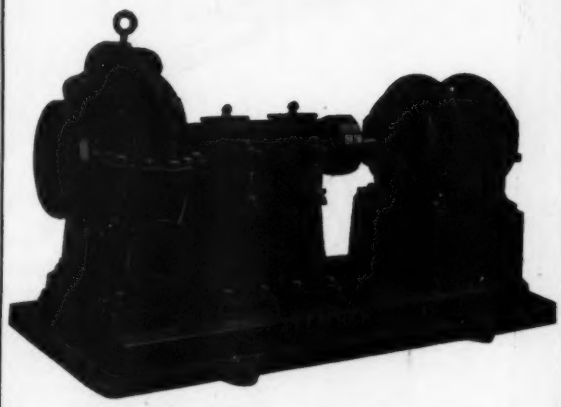
Fraser-Brace, Ltd., are making good progress with the new $2,000,000 fibreboard mill which they are constructing for International Fibreboard Co., an International Paper subsidiary. It is expected the mill will be completed and production started early next spring. The foundations for the new building have already been completed and the walls are rapidly being erected.

Anglo-Canadian Pulp and Paper Mills have now completed their mill at Quebec. Final touches are being made, and very soon paper will be coming off at least one of the four big Walmsley machines which constitute the first unit of the mill.

A party of fifteen students from the Ecole Polytechnique, Montreal, in charge of Prof. Villeneuve, were recent visitors to Grand'Mére, where they were conducted over the mills of the Laurentide Co., and the plant of the Laurentide Power Co.

The staff of the Pulp and Paper Division of the Forest Products Laboratories, at Montreal, are very busy with

Frederick
Centrifugal
• Pumps •



Single-Suction Standard Paper Mill Stock Pump

There are other good pumps, other efficient pumps, other dependable pumps. But if you want to find out definitely which is the *best* pump for you to install, compare the service records of Frederick Pumps in your line of service with those of any other pumps.

There is a Type of Frederick Pump Suitable to Your Needs

The Frederick Iron & Steel Company
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Offices in Principal Cities

RYTHER AND PRINGLE COMPANY
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RYTHER CHIP SCREEN

INSTALLED IN WOOD ROOM OF 40 TON SODA MILL

The RYTHER CHIP SCREEN operates at high speed without vibration. It is very compact and has high capacity. 2 H. P. is required for rotation.

The screening operation is divided into 4 stages which relieves the load on the tables and accomplishes perfect rejections. The construction is of steel throughout and the drive is Timken mounted, reducing maintenance charges to the minimum.

FOR CANADA REFER

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research work, and with the planning of their installation in the Cellulose Institute building, at present nearing completion. Dr. J. W. Ross, who has been studying methods of doing some special investigation at the Faserstoff Institute, with Dr. Herzog, is back at the laboratories, with new ideas and increased enthusiasm for the possibilities of developing Canadian resources and opportunities.

ONTARIO

Abitibi the Largest Unit

With Abitibi Power and Paper, Spanish River Paper Mills and four subsidiaries consolidated under one control, there is created by far the largest single unit in the Canadian newsprint industry. Until this merger, this position was held by Canadian International Paper, with a total capacity of 1,300 tons when the machines at the new Gatineau mill are tuned up to the maximum production. The merger, however, brings under one control an installed capacity of over 2,150 tons of newsprint daily, or approximately 650,000 tons a year.

This actually represents over 50 per cent of the total production of Canadian mills in 1923 (1,266,000 tons) and over 40 per cent of the 1925 output. Today the installed capacity in Canada is 8,500 tons a day, of which the "merger" mills cover over 25 per cent. The total Canadian and United States production averages about 12,500 tons daily, of which the new Abitibi capacity represents fully one-sixth.

President Smith, of Abitibi, has stated that no changes are contemplated in the officials or operating personnel of any of the constituent companies; but close co-operation and an exchange of information between the managements of the different units, the most efficient operation may be applied to all the mills.

One of the most important advantages in the consolidation of the various interests involved will result from the geographical location of the mills, extending from seaboard (at Murray Bay, Que.) to the central west (at Pine Falls, Man., 100 miles or so from Winnipeg). This situation is favorable for European and other foreign exports. In addition, it will facilitate deliveries to the largest consuming centers in the United States and Canada at the very lowest freight rates.

John F. Ellis, head of the firm of Barber-Ellis, Ltd., Toronto, manufacturing stationers and paper dealers, recently celebrated his eighty-second birthday. He is at his office every day, and is remarkably active for a man of his years. Mr. Ellis is the dean of the wholesale paper trade in Canada, and is honorary president of the Canadian Paper Trade Ass'n.

At the Made-in-Canada Exhibition, recently held in Peterboro, the Interlake Tissue Mills, of Toronto, was awarded a silver cup for the most imposing display.

The sales office of the Georgetown Coated Paper Mills, in Toronto, has been moved from the Metropolitan Bldg. to the Kent Bldg., at the corner of Yonge and Richmond Sts. Paul Fleck, son of L. E. Fleck, president of the company, is in charge of the Toronto office.

While earnings of Provincial Paper, Ltd., Toronto, successor to Provincial Paper Mills, Ltd., did not show any substantial increase over last year for the first six months of 1927, it is understood that a considerable advance has been recorded during the last half of the current year to date. The company has the advantage this season of the new paper machine at the Port Arthur mill.

At a meeting of the Ontario Pulp and Paper Makers' Safety Ass'n, held in Toronto early last month, there was a very thorough discussion of the good and bad points of the system of merit and demerit rating at present in operation in Ontario. The consensus of opinion at the meeting was that merit rating

Are you "cleaning away" the life of your wire?

ARE you cleaning wires with acid? If so, do you find that cleaning leaves them rough—that their life is shortened? Cleaning wires the "acid way" is an expensive practice, a practice that soon "cleans away" the life of the wires.

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Paper manufacturers everywhere find modern, safe Oakite materials ideal for all their cleaning. They speed washing and rinsing of felts; eliminate much hand brushing of wires; save effort in cleaning cylinder rolls, screen plates and sieves. These are advantages too important to overlook. Write for details, or for an Oakite Service Man to call. No obligation.

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"Can't you cut that steam cost?"

"I'm sure I could if I had the right kind of flow meters to give me a RECORD of where, when and how much steam was produced and used.

"With adequate equipment of recording flow meters, I could watch the steam cost for each pound of paper produced in the plant."

Brown Electric Flow Meters will give you the dependable records that you must have if you want to know what your steam costs to make and use.

Ask for more information, as well as Catalog 20. The Brown Instrument Company, 4411 Wayne Avenue, Philadelphia. Branch offices in 18 principal cities.

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1. Inductance Bridge circuit.
2. Chart automatically planimetered.
3. Inherently independent of voltage fluctuations.
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5. Double-range Manometer.

Brown Electric Flow Meter

on the Inductance Bridge Principle

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should be continued, but that demerit rating should be abandoned. The matter is to be further studied by the various industrial organizations of the province, after which it is intended to present a concerted opinion to the Workmen's Compensation Board of Ontario.

The Lincoln Pulp and Paper Co., a few months ago installed an embossing machine at its mill at Merritton, Ont., and this is working very satisfactorily. The company recently put out a very attractive sample showing different patterns of embossed glassine which has been sent to its customers.

Progress is being made on the plants of the Canadian Paperboard Co., and the Dominion Envelope and Carton Co., at present under construction at Toronto, and it looks as if they will be in operation during the coming summer.

E. C. Martin, who for a considerable period has been sales and advertising manager of the Interlake Tissue Mills, has resigned his position to take up new activities at the beginning of the new year.

The United Paper Mills, of Toronto and Hamilton, will soon open a branch in London, Ont., where a representative stock will be carried. Suitable quarters have been leased, and W. W. Howell, who for the past ten years has been Western Ontario representative of the firm, will be manager of the new warehouse and office.

Charles E. Allen, who is well-known in paper circles, has been appointed special representative of the Fred W. Halls Paper Co., Toronto, and has entered upon his new duties. Mr. Allen was, until recently, sales manager of the United Paper Mills, and previous to that was in business for himself for some years as the Allen Paper Co., until he disposed of his interests to the United Paper Mills. For many years he was on the sales staff of the Buntin, Reid Co., Toronto.

Col. C. H. L. Jones, vice-president of Spanish River Pulp and Paper Mills, recently stated that his company is not in the market for any power. After submitting to many years of power shortage, he said, they had straightened out their own position by the installation of a steam turbine and generator set.

The Kenora Paper Mills, Ltd., Kenora, recently ran up another world's record for newsprint production, when the two machines, travelling at top speed and without a break, turned out 260.53 tons of paper, exceeding the previous world's record of 259.55 tons, made by the same two machines.

BRITISH COLUMBIA

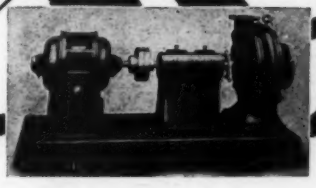
B. C. Mill Improvements

Work has been started on a new and somewhat unusual hydro-system, by the British Columbia Pulp and Paper Mills. An 800-foot tunnel, 20 square feet in cross section, is to be drilled at a level 80 feet below the crest of the present dam. The shaft will have two separate outlets, one being of wedge design the full size of the tunnel, while the other will have 18-inch and 15-inch gate valves, with pipe connections for future hydro-electric development. W. G. Swan is the engineer in charge of this work, which will cost in the neighborhood of $25,000, and the contract has been let to Stewart and Barber.

The new riffler and screen building that had been under construction at Woodfibre is now finished, and 42 new Hymac screens have been installed. Centrifugal screens have been discarded, the new ones being inclined screens. The company also put in 13 flat screens at the Port Alice mill.

The pulp from the Port Alice mill is earning an enviable reputation throughout the middle west and on the Atlantic

2 years ago—2 Today 59



Two years ago, 2 Warren Stuff Pumps were installed in a large paper mill. Their dependable service and economical operation resulted in the purchase of 57 additional Warren Pumps to be used in other mills operated by the same company.

Designed by engineers thoroughly familiar with pulp and paper mill conditions, Warren Stuff Pumps move stock faster, do not require attention and will not clog. Let us show you what they can do handling your kind of stock. Write for Bulletin.

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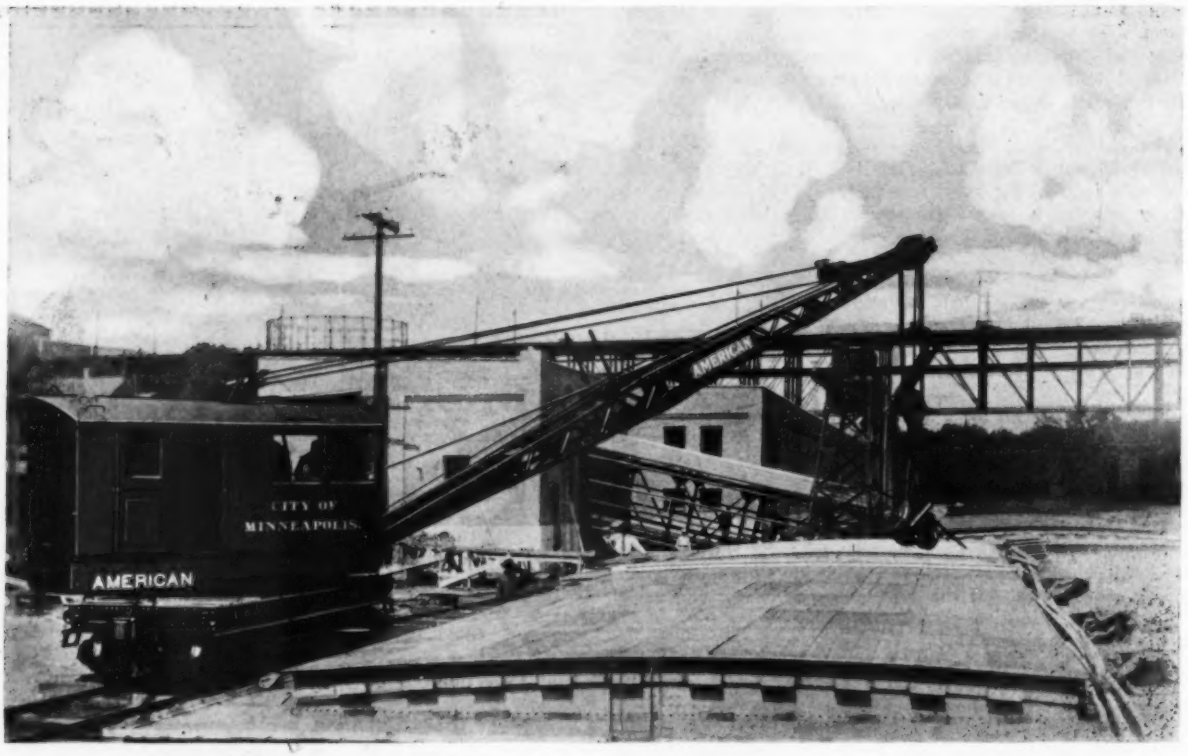

The AMERICAN Gasoline Three-Speed Crane Saves the wages of a fireman and a watchman

The flexibility of steam, with the convenience and economy of gasoline—that is what we offer you in the "AMERICAN" Gasoline Three-Speed Crane. The powerful four cylinder motor fits down into the heavy revolving deck casting and is bolted solidly to it. This greatly reduces vibration.

The heavy automotive type three-speed transmission works just like the transmission on your car; low gear for a powerful start, intermediate for average work and traveling and high gear for rapid traveling.

The transmission is operated with a foot clutch and an automotive gearshift lever.

New descriptive booklet just out. A copy is yours for the asking.

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seaboard. It is known as "snow-white," and is of an especially high quality. The acceptance of this particular product has been so spontaneous that the company has actually had to decline orders.

Stuart Cameron and Co. have been awarded the contract for the construction of the new breakwater at Powell River. This is the second structure of its kind to be built by the Powell River Co., and will cost approximately $116,000, part of which will be borne by the federal government. The breakwater will be about 1000 feet long.

NEW BRUNSWICK

I. P. Buys Fraser Company's Limits

Arrangements have been concluded between Fraser Companies and International Paper Co. for the sale to International Paper of approximately 1,000 square miles of Fraser's timber lands tributary to the Restigouche River and Baie des Chaleurs. The lands acquired are adjacent to areas already owned by International, tributary to the Restigouche basin.

Fraser retains very large holdings of timber lands in the Restigouche River basin, which the company will continue to operate in connection with its Campbellton mill. The lands acquired by International complete the pulpwood reserve necessary for the operation of that company's projected newsprint mill in this section of the province.

A recent meeting of shareholders of Fraser Companies authorized conversion of the company's present outstanding $10,000,000 par value of $100 shares of common stock into 300,000 shares of no-par-value common, that is, a split of three for one.

NOVA SCOTIA

The forest ranger prizes annually offered by Frank J. D. Barnjum for the best forest-fire protection service in the province have just been awarded for the season of 1927, as follows: first prize of $500 to H. B. Verge, Barss' Corner, Lunenburg County; second prize of $350 to W. B. Fraser, Waternish, Guysboro County; and third prize of $150 to George S. Dickey, Middle Musquodoboit, Halifax County. The province has experienced this season the smallest forest-fire loss in its history, smaller even than last year, which was a record up to that time. The total area burned over in the entire province was approximately 2,800 acres.

For some time past the managing directors of the Minas Bay Pulp and Paper Co., with their engineer, J. L. Warren, of Riviére du Loup, Que., have been in Hantsport surveying the district in order that the most suitable location for their projected new plant might be selected. Though the plans of the company have not been officially announced, it is reported that they finally decided on a site which includes practically the entire waterfront district of Hantsport from Williams St. to Prince St.; and it is said that all the necessary properties in this district have been purchased by company agents.

Stringent laws which would drastically control all timber-cutting operations will have to be adopted to protect Ontario's timber resources and prevent large territories being laid waste by hasty lumbermen, lack of reforestation and preventable fires, in the opinion of Hon. Wm. Finlayson, Ontario Minister of Lands and Forests. Instead of spending millions to bring European immigrants to this country, Mr. Finlayson believes that it would be more profitable to spend thousands moving Canadians from worked-out settlements to sections replete with good soils.

During the past one hundred years, Waldron has worked with these industries—supplying valuable data, furnishing specific information, making proper recommendations concerning processing methods and machinery to improve products. No other organization is so well equipped with experience and knowledge gained from experience to assist in solving your problems. If it is for paper converting—consult Waldron.

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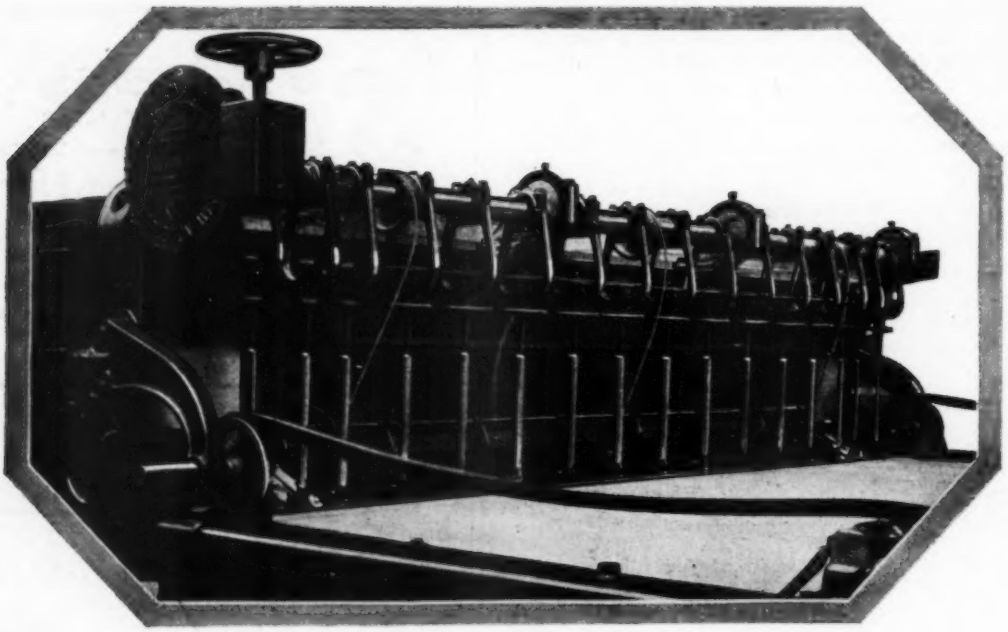


Over 100 Repeat Orders~

The Voith Inlet not only is installed on one machine but after being in operation for a time, another is installed—and in one mill as many as thirteen. This wide acceptance is proof that the Voith Inlet is right—that it is a profit-making piece of equipment. *It repeats because it performs.*

Easy to install and easy to operate, the Voith Inlet will increase production more than 10% over the old slice method, depending on drying capacity and the mills auxiliary equipment, producing *better paper at a lower cost.* Wires last from 10% to 15% longer. There are fewer breaks to cause shut-down of paper machines.

The Voith Inlet can be equipped with our perfected Deckling-In Device for adjusting between deckles. With this device the Voith Inlet allows the operator to deckle-in *while the paper machine is running*—eliminating former inconveniences and increasing the tonnage of paper machines.

Let us show you why over 100 repeat orders have been received on the Voith Inlet. An attractive booklet with complete information will be sent upon request. Ask for your copy *now.*

VALLEY IRON WORKS CO.

Machinery for Paper and Pulp Mills

APPLETON WISCONSIN

New York Office: 350 Madison Avenue
Western Manufacturing & Sales Division, Smith & Valley Iron Works Co., Portland, Oregon

NORTHERN NEW YORK NEWS

Harrisville Mill Re-Opens

The mill of the Harrisville Paper Corp., Inc., at Harrisville, formerly the Diana Paper Co., re-opened Dec. 5. After the bankruptcy of the Diana mill last fall, the mill was purchased by the St. Regis Paper Co. although it will be operated independently and not as a part of the St. Regis group. For the present, catalogue paper will be manufactured. One of the two machines was started Dec 5. and it was expected that the other would start within a short time. Clark Farnum, who was formerly associated with the West End Paper Co. at Carthage, is superintendent of the Harrisville mill, succeeding M. P. Wingate who recently resigned.

The machines have been completely remodeled and the latest modern equipment has been installed. The old time drives have been eliminated and Terry turbines installed. The entire steam plant and coal handling equipment has been modernized and pulverized fuel will be used. The St. Regis Co. has introduced the pulverized fuel at its Deferiet plant and expects eventually to have all its plants equipped with this type of burner. The two machines will be operated from one boiler. A new ground wood mill where all the work is to be done by electrically operated grinders has been constructed. New conveyors have been constructed for conveying pulp wood and lap pulp and a new shredder to shred the sulphite as it is received has been installed. The mill is equipped with sufficient chest capacity to keep sulphite pulp in solution for use in the beaters. While it is expected to produce catalogue paper for a time, within a few weeks the company will be making manila, dry finish butcher and hanging papers.

I. P. Development on Saranac River

International Paper Co. has commenced work on a hydro-electric development at Kent's Falls, on the Saranac River, New York, and expects to place the plant in operation next summer. The plant, which will be twelve and one-half miles upstream from Plattsburgh, where the river empties into Lake Champlain, will be designed for three generators of 4,000 h.p. each, of which two will be installed initially.

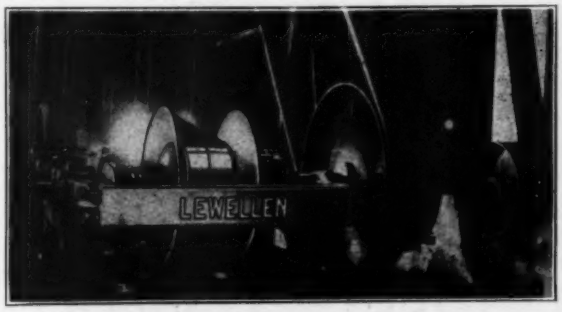
At Cadyville, one and one-half miles above Kent's Falls, the company already has in operation a 3,000 h.p. hydro-electric plant which was placed in operation in January, 1922. These two plants will be interconnected.

Power from the Cadyville plant of the company is sold to the Chateaugay Ore and Iron Co. for use in its iron mines at Lyon Mountain and to the Plattsburgh Gas and Electric Co. for general distribution. These companies will take power from the Kent's Falls plant to meet expanding requirements.

Freight Rate Hearing

The greatest representation of paper manufacturing interests ever seen in Northern New York, gathered in Watertown at the hearing on freight rates held by the Interstate Commerce Commission. Examiners W. H. Smith and H. A. Sullivan heard the testimony which was presented by Wilbur LaRoe of Washington and J. A. Quinlan, traffic manager of the St. Regis Paper Co. Earl C. Calhoun of New York represented the defendants. The specific cases which were called were St. Regis Paper Co. vs. Atchison, Topeka and Santa Fe Ry.; Harrisville Paper Corp. vs. Ann Arbor Railroad Co.; St. Regis Paper Co. vs. Ann Arbor Railroad Co.; Taggart Brothers vs. Atchison, Topeka and Santa Fe; Dexter Sulphite Co. vs. New York Central. The complainants seek to have freight rates reduced on newsprint, paper bags and wrapping paper shipped from this locality to points west of Buffalo.

George W. Sisson, Jr., president of the Racquette River Paper Co., was one of the principal witnesses. He testified that paper manufacturers of Northern New York face three



INSTALLATION AT MICHIGAN CARTON CO.
No. 14, class "D" LEWELLEN Transmission driving Black-Clawson cutter at the Michigan Carton Company. Machine speed—50 to 250 F.P.M. Sheet length—16½" to 82½" at any speed.

" . . . . Operates Without Variation"

IN a recent letter from a user of a Lewellen Variable Speed Transmission he says: "Due to the sturdy construction of your drive it operates entirely **without variation.**"

In this particular instance the Lewellen was installed on a cutter. But whether on cutters, winders, slitters, dryers, paper machines or anywhere else in a paper mill, this is true.

The Lewellen has been constructed to eliminate even the slightest variation. The design of the discs is such that when the transmission blocks enter the discs they do not and cannot change position. Both the tightening and shifting screws are provided with automatic locks so that when once they are set they stay that way.

The friction surface of the transmission belt is a special soft mineral tanned leather—the most reliable friction surface possible

Another thing, the bearings on the Lewellen are always in perfect alignment, and the shaft always runs absolutely true. On the ball bearing type the thrust bearings are enclosed in oil-tight, dust-proof mountings.

The bearing mountings carry pivots exactly central with the ball bearing so that at all times the load is evenly distributed over all the balls in the bearing.

It is easy to understand from these features why the Lewellen Variable Speed Transmission is known to paper mill men as the drive that operates steadily, evenly, **without variation.**

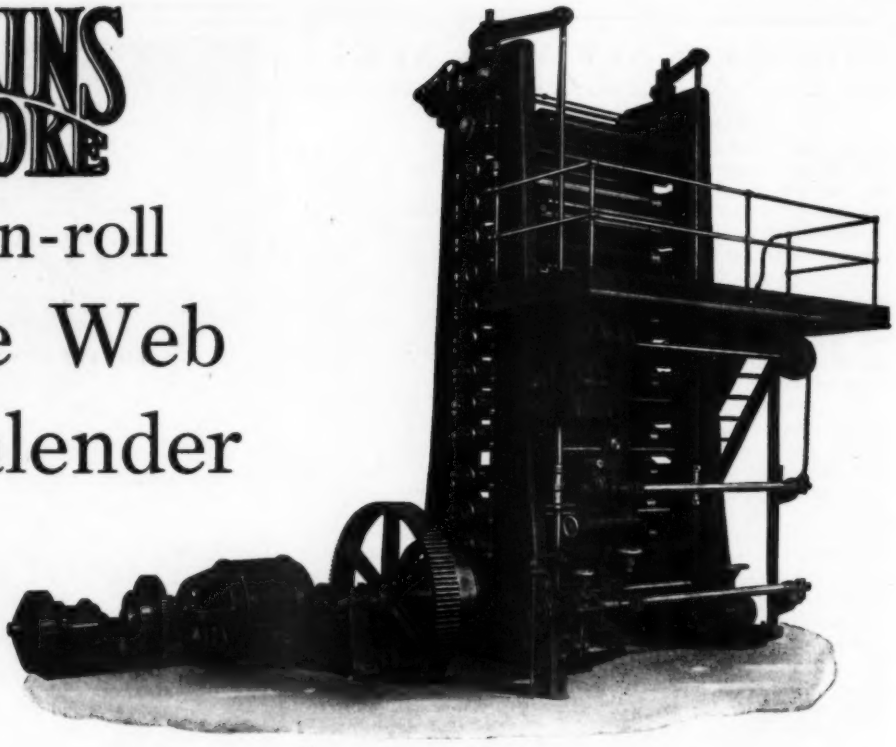
May we send you the complete story of the Lewellen? Just a card will do.

LEWELLEN MFG. CO.
Columbus, Indiana

LEWELLEN *Variable Speed* **TRANSMISSION**

PERKINS
HOLYOKE

Fourteen-roll
Glassine Web
Supercalender



The special requirements of glassine producers are met by this machine. A development of the Perkins standard Web Supercalender made for finishing plain and coated paper, and card stock. Direct connected two motors over running clutch drive.

Higher operating speed. Greater drying capacity.

B. F. Perkins & Son, Inc., Holyoke, Mass.

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COTTON ROLLS - PAPER ROLLS - EMBOSSING ROLLS - CHILLED IRON ROLLS - GRANITE PRESS ROLLS - WEB SUPERCALENDERS - GLASSINE SUPERCALENDERS - FRICTION CALENDERS EMBOSSING CALENDERS - SHEET CALENDERS - PLATERS - MULLEN PAPER TESTERS TENSILE TESTERS - VENTILATING FANS - RAG CUTTERS - STOCK CUTTERS - PAPER DAMPENERS BLEACH EJECTORS

great problems, disappearance of raw material, expansion in Canada, and freight rates. Unless there is the fullest co-operation between the New York Central and the manufacturers on a fair basis, progressive disappearance of paper mills in that section might be anticipated. He stated that his company had lost a large tonnage to Chicago due to the high freight rates and is now barred from the Chicago markets. The business thus lost went to the mills in the Great Lakes district.

Frank S. Augsbury, president of the Algonquin Paper Corp. of Ogdensburg stated that his company lost the contract of one-third of its production, or 10,000 tons of newsprint, a year ago in the Chicago market to a Minnesota and Ontario Paper company due to freight rates prevailing. The contract mentioned was for magazine paper. The customer paid the freight allowing five dollars a ton, and over that was required to pay the freight which amounts to more than 25 cents per hundred pounds.

The following officers were elected by the International Brotherhood of Papermakers, according to an announcement made in Albany following the tabulation of the votes: President, W. R. Smith of Albany; first vice president, Frank P. Barry; second vice president, M. H. Parker; third vice president, George J. Schneider of Appleton, Wis.; fourth vice president, Arthur D'Aoust; sixth vice president, A. F. McLeod of Espanola, Ont.; secretary, Arthur Huggins of Holyoke; treasurer, Archie Hook of Chicago; auditor, David Larner of Tonawanda. Owing to no candidate receiving a majority in the contest for fifth vice president another election must be held for that office. Arthur Huggins was also elected editor of the Papermakers' Journal.

The New York state conservation commission plans to distribute 40,000,000 trees for planting during 1928. Twenty-three and a half million were distributed this year.

Word from Henry Baker

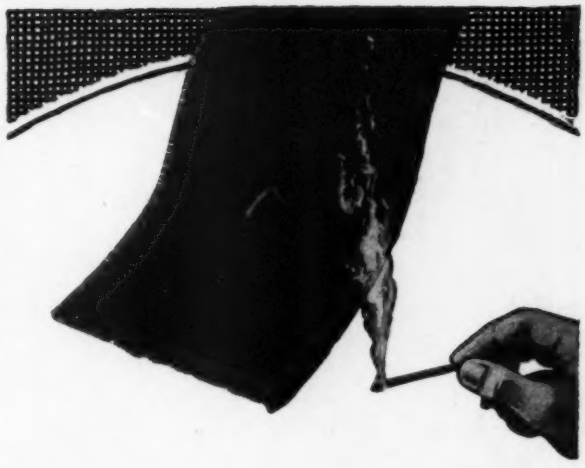
After having been lost to his friends for several years, Henry Baker, a paper mill engineer, has been located in the far interior of China. News came in a letter written by Mr. Baker to P. D. Taylor of Carthage, a retired paper mill engineer who knew Mr. Baker in China.

Mr. Baker who was formerly city engineer of Watertown went to China in 1908 to construct the mills of the Chinese Government Paper Co. at Chenkaiki. This was done before the revolution which dethroned the boy king. No word was heard of him for several years. His letter says that he is located at Kuling in the northern part of China. It is reached by taking a boat at Shanghai and sailing 450 miles up the Yangtse river. From there the traveler goes by sedan chair 18 miles over the mountains to Kuling. It was feared that Mr. Baker had perished during the many revolutions in that country. In his letter Mr. Baker said that he was building schools and houses.

The first machine to be operated since reconstruction of the Fort Edward plant of the International Paper Co. has been placed in operation after a series of tests. The alterations have been under way since last spring and cost approximately $2,000,000. The mill will manufacture high grades of paper, the entire concern having been changed from newsprint to book and bond paper. About 800 men and 150 women will be employed when the mill is in full operation. The reconstruction will continue throughout the winter until the entire mill is changed over.

With a capitalization of $50,000, the Beaverbox Manufacturing Co., Inc., of Lowville, has filed incorporation papers. The company will manufacture paper and fiber containers and will be located at Beaver Falls. The incorporators are Howard I. LeFevre, Harold M. LeFevre and DeWitt LeFevre.

Henry J. Conklin, 57, an employee of the chipper room of the Deferiet mill of the St. Regis Paper Co., was smothered



Don't burn felts!

START the sections quickly—but start them easily. ***And don't burn the felts!***

No need for over acceleration or jerky starting when a C-H Magnetic Clutch will smooth out all the shocks and bring the section up to full speed without slipping the felts.

Just press the button controlling the C-H Clutch and smooth acceleration is obtained automatically. It saves felts, decreases wear and tear on equipment, saves time and reduces starting current peaks.

The interesting story of Magnetic Clutches!

Their construction—characteristics—uses—are fully described in the Cutler-Hammer Clutch Booklet, P-11. Every mill operating executive should read it.

A line from you will bring your copy

The CUTLER-HAMMER Mfg. Co.

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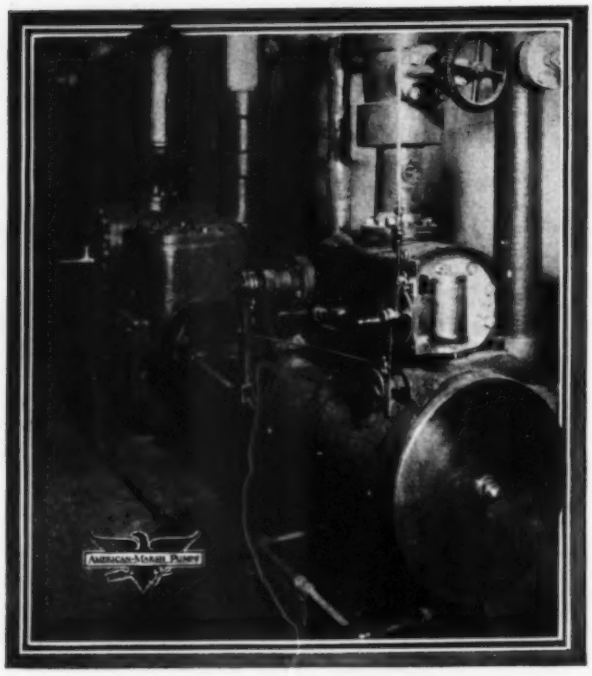
Industrial Efficiency Depends on Electrical Control



American-Marsh Boiler-Feed Pump, outside center packed, 125 pounds pressure.

Friends in Mills Everywhere

IT IS significant that to date this company has over 200,000 pumps installed throughout industry, of which a goodly portion are operating in your field. Such wide-spread acceptance is invariably an indication of but one thing—an exceptionally fine product. Keeping pace with every advancement, modern, efficient, unfailing—certainly is this true of American-Marsh equipment which has made friends in paper mills the country over.

If you are not familiar with American-Marsh pumps, it will pay you to investigate. Write for Bulletins. Better still, have our engineers submit a definite recommendation and cost estimate to meet your particular requirements.

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AMERICAN STEAM PUMP COMPANY
BATTLE CREEK, MICHIGAN, U. S. A.

Complete Line—Centrifugal and Steam Pumps

Effective Aids in the attainment of Efficient Lubrication

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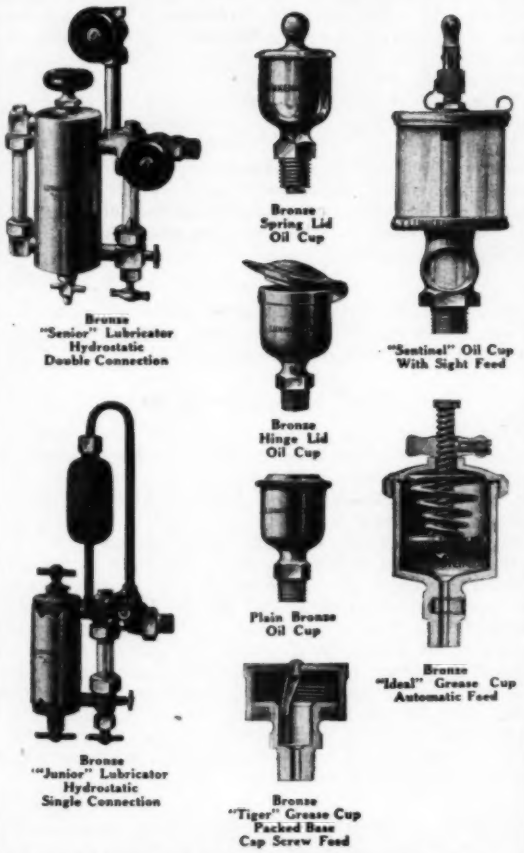
LUBRICATORS OIL CUPS AND GREASE CUPS


Bronze "Senior" Lubricator Hydrostatic Double Connection
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Bronze Hinge Lid Oil Cup
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Bronze "Ideal" Grease Cup Automatic Feed
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The Lunkenheimer Company manufactures a complete line of Lubricators, Oil Pumps, Oil and Grease Cups, in a wide range of types, sizes and capacities.

Lunkenheimer Distributors are located in all industrial centers and carry complete stocks. They will fill your requirements promptly.

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"QUALITY"
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to death under a huge mass of chips Nov. 16. It is believed that he suffered a heart attack while working and was buried under the chips before he could recover.

Four new beaters have been installed by the Champion Paper Co. in West Carthage. The new machines are the same size as those already in use and will bring the total number up to eight. While the new machines will not add to the production, the superintendent, Mr. Bronk, says that they will improve the quality. For some time the mill has been producing kraft paper.

Elton Brainard Risley, for many years salesman of the Aldrich, Dean & Aldrich Paper Co., predecessor of the Oswegatchie Paper Co., passed away Nov. 13 at his home in Natural Dam, at the age of 76.

Sylvester R. Benson of Cohoes, trustee for the bankrupt Troy Paper and Board Manufacturing Co., Troy, has sold the property to W. W. Snyder of Cohoes. The sale includes the title and interest in the mill and the remaining tangible assets. Mr. Snyder is a former owner of the mill, having sold it to the Troy concern two years ago. He held a mortgage on the mill amounting to $60,000. Mr. Snyder plans to manufacture chip board used for pasteboard boxes.

NEW YORK CITY NEWS

Oakite Men in Conference

Events to which all representatives of Oakite Products, Inc., New York, look forward with pleasant anticipation as the year draws to a close are the annual sales conference and the district managers' conference, which are held in November and last three days. The conferences take place at the general offices of the company, 22 Thames St., New York, and are educational in character, designed to advance the interests of the company, papers being read and discussed on a variety of topics, technical and otherwise, including means and methods of using Oakite in the various industries, sales and service plans, advertising problems and organization work. On the evening of the third day a banquet is held, at which musical entertainment is provided and brief addresses are made by executives of the company.

A representative of THE PAPER INDUSTRY was present on Wednesday, November 9, when upwards of 200 members of the Oakite organization and a few invited guests came together at the Hotel Pennsylvania and spent an evening of mirth and entertainment following a banquet. On this occasion President D. C. Ball gave a thrilling account of big game hunting in the tropics, which was illustrated by a moving picture exhibit of animals in their native wilds, as well as gorgeous scenery caught by him with the camera on his recent trip abroad. One of the interesting features of the banquet was the award of prizes to salesmen of the firm who had gone ahead of their quota 110 per cent.

International's Income Increases

The consolidated statement of earnings of the International Paper Co. and subsidiaries for the third quarter of 1927 shows a net income of $1,383,185 after depreciation, charges and taxes, as compared with $877,492 for the same quarter last year. Net income for the first nine months of this year amounted to $3,790,419, against $2,154,709 in the corresponding period of 1926. The surplus after dividends was $29,685, compared with $5,966 for the 1926 period.

Early in November this company announced its third annual offering of 7 per cent preferred stock to its officers and employees and those of its subsidiaries, at $100 a share, which compared with the closing price, on the New York Stock Exchange on the day the offering was opened, of $103¼. The current price to employees, which includes the January 16 dividend, compares with a price of $94 a share last year and

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Immediate Shipment from Stock

Bars, Shapes, Structurals, Rails, Plates, Sheets, Rivets, Bolts, Nails, Wire, Chain, Turnbuckles, Shafting, Boiler Tubes, Boiler Fittings, Corrugated Sheets, Concrete Reinforcing, Welding Rods, Babbitt Metal, Tool Steel, Bar Iron, Refined Iron, Floor Plates, Safety Treads, Small Tools, Machine Tools, etc.

Write for the Journal and Stock List—the "key" to Immediate Steel.

JOSEPH T. RYERSON & SON INC.

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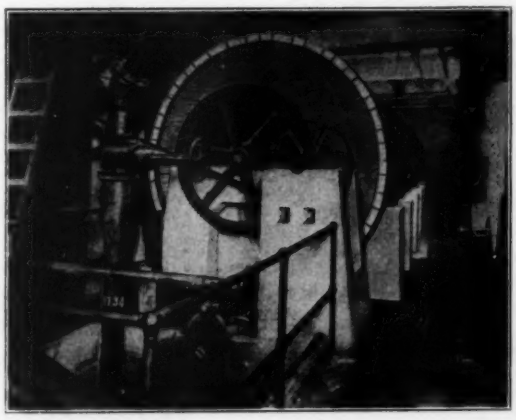
STEEL



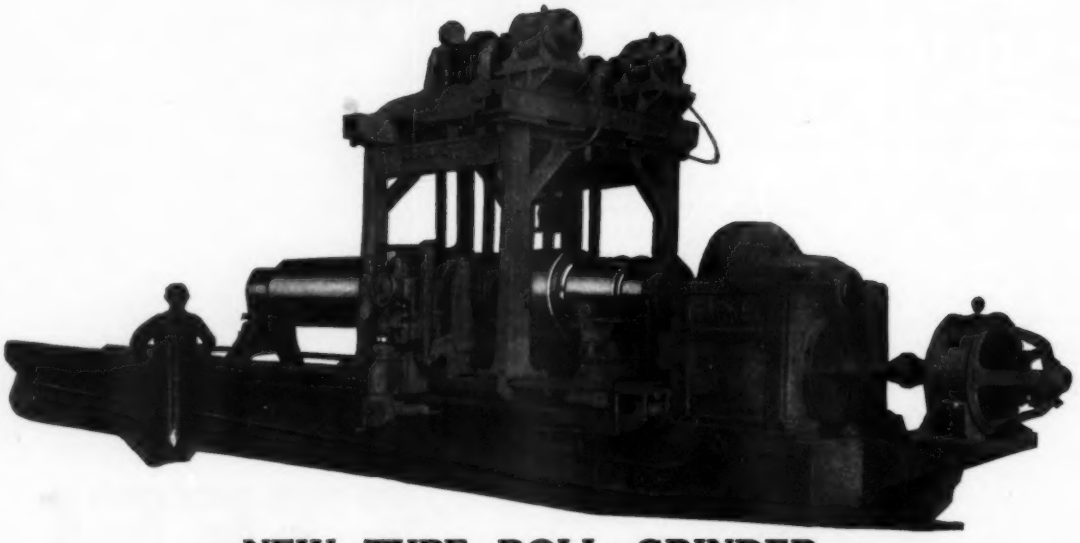
Paper Mill Tanks

The above installation in a well-known Ohio paper mill is only one of Hauser-Stander's successful installations.

Hauser-Stander has been building tanks for over fifty years and has particular knowledge of paper mill men's requirements.

The Hauser-Stander Tank Co.
CINCINNATI, OHIO

FARREL



NEW TYPE ROLL GRINDER

Built in 24″, 32″, 36″ and 42″ sizes, all Electrically driven throughout and equipped with New Crowning Device, Geared Head and Automatic Lubrication.

FARREL CALENDERS

are made with
HYDRAULIC,
ELECTRIC
or
RATCHET
LIFT
all operated
from the floor

178″ Stack with Hydraulic Lift

FARREL CALENDER ROLLS

are made in
all sizes up
to and including
264″ on
the face.

FARREL-BIRMINGHAM COMPANY INC.
ANSONIA, CONN.

Successors to

Farrel Foundry & Machine Co., Ansonia, Conn. *and* **Birmingham Iron Foundry, Derby, Conn.**

Branch Plant: BUFFALO, N. Y.

$90 two years ago. More than 3,300 officers and employees own stock in the company, the average holding being about five shares. In addition to the regular dividends, employee-holders of the preferred stock will receive a bonus of $1 a share on January 1, 1929, and a bonus each January 1 thereafter to January 1, 1933, at an increasing rate of $1 each year, making the total $15 to 1933.

The Great Northern Paper Co., on November 21 ordered payment of an extra dividend of 25 cents a share on its stock.

Fire on October 29 severely damaged the stock and plant of the Blanco Paper Corp., paper merchants and distributors, of 426-428 W. Broadway, New York City. The fire broke out shortly after the employees of the company had left for the day, presumably starting in the cellar of the building which housed also a bookbinding company, and required the combined efforts of a number of fire companies before it was put under control. The cellar and the first three floors of the building were burned out, and three firemen were treated for injuries.

A petition in bankruptcy was filed November 2 against the Hamilton Card and Paper House, Inc., paper dealers, of 27 Greene St., New York City, by the Ireland & Taub Paper Co., Inc., for $1,300; Majestic Mills Paper Co., $221, and the Tioga Paper Goods Co., Inc., $19. Louis Karesik was appointed receiver, under $5,000 bond. Liabilities of the concern are put at about $25,000, and assets at about $10,000.

Announcement is made that Leonard O. White, who recently became associated with the Seymour Co., paper merchants, of 323 W. 16th St., New York City, has been made vice-president and general manager of the company. The Seymour Co. has been appointed agents in the metropolitan district for the Standard Paper Manufacturing Co., Richmond, Va., manufacturers of blotting and bond papers.

The Tri-Boro Paper Co., New York City, was incorporated under New York State laws a few days ago to conduct a general merchandising business in paper and twine. The company has a capital of $10,000, and C. Feld, R. Keshner and H. Maiman were the incorporators, while the corporation is represented by Fisher, Brandt & Berger, 152 W. 42nd St., New York City.

The American Paper and Pulp Ass'n has announced that its annual meeting next year will be held on Tuesday of Paper Convention Week, February 20-23, with a morning and afternoon session, instead of on Thursday, as hitherto. The annual banquet will be on Thursday evening, as formerly.

New Paper and Bag Plant for Alabama

The E-Z Opener Bag Company, one of the largest producers of paper and paper bags in the country, will establish a plant at Tuscaloosa, Alabama, with an investment of five or six million dollars.

The company has been in business for a quarter of a century and operates plants at Decatur, Illinois; Orange, Texas; New Orleans, Louisiana; and a large paper pulp mill at Braithwaite, Louisiana.

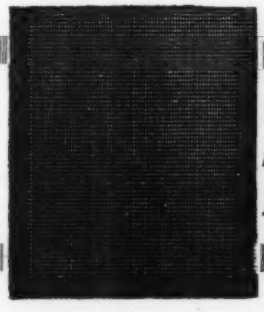
The plant, when completed, will produce 90,000,000 pounds of finished paper and paper bags per year—about 300,000 pounds daily. Nine cars a day for the finished product and twenty-five for the raw material will be required. The plant will employ 1,100 people and will have an annual payroll of approximately $1,000,000.

The 1928 annual meeting of The American Forestry Association, Washington, D. C., will be held at the Statler Hotel, St. Louis, Mo., February 17 and 18, it has been announced. While the program has not been completed, the association has arranged for a number of noted speakers and conservationists to attend.

Superior

seams

The superiority resulting from the best materials, seventy-five years and more of experience in weaving wire cloth, and the production of a smooth even mesh is "sewed up" in Superior wires by the application of a seam designed for the requirements of each particular job. The seam in a Cabble wire is like every other feature—Superior



Wires and facings for All Paper and Pulp mill purposes

The William

Cabble

Excelsior Wire Mfg. Co.

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Longcrimp Fourdrinier Wires

USED EXTENSIVELY ON
Kraft, Wrapping and Newsprint Machines

Give Longer Average Service than the Regular Weave

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See page 302 in the 1927 Paper and Pulp Mill Catalogue

PORTLAND, OREGON

Is the ideal location for that new Pulp and Paper Mill of yours.

Portland is in the heart of the big timber region of the Pacific Northwest. Has an abundance of good water together with a plentiful supply of cheap hydroelectric power for manufacturing purposes. Good ocean and railway shipping facilities, a mild climate, and a fair supply of skilled labor, practically all of which is non-union.

I would be pleased to serve you in the location, design and construction of that new mill of yours.

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Complete Building Construction
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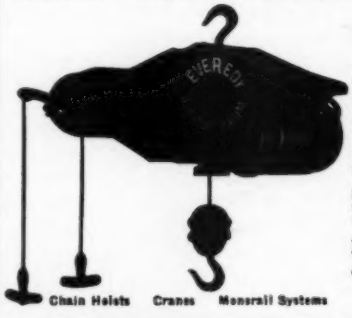
Iron Workers, Cement Workers, Bricklayers, Carpenters, Roofers, Plumbers, Electricians, Cabinet-makers, Painters and Paperhangers; also Real Estate Bonds and Mortgages

500 lb. Electric Hoist

$225.00



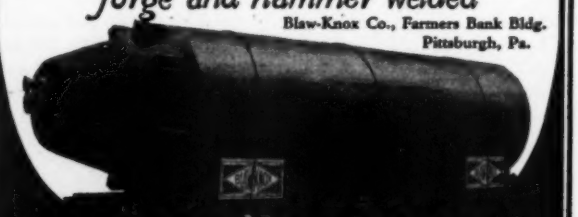
This Everedy Hoist is the most accessible hoist made. Light—500 lb. hoist weighs 225 lbs.; 1000 lb. hoist 250 lbs. Speedy — 40 feet per minute A. C., 85 feet per minute D. C. Limit stop at top and bottom adjustable to any point. Suspended wherever chain or air hoist is placed.

READING CHAIN & BLOCK CORP.
READING, PA.

DIGESTERS

forge and hammer welded

Blaw-Knox Co., Farmers Bank Bldg. Pittsburgh, Pa.



BLAW-KNOX

PACIFIC COAST NEWS

McCormick Co. to Erect Pulp Mill

Announcement was recently made that the Charles R. McCormick Co. of St. Helens, Ore. plan to erect a sulphate pulp mill, probably on the site of its lumber mill which was destroyed by fire several years ago. Detailed plans will not be given out until articles of incorporation are filed, but it is said the mill will have a capital stock of $3,000,000 and that New York and Wisconsin capitalists are handling the financing of the enterprise.

According to H. F. McCormick, vice-president, the mill will be limited at first to the manufacture of sulphate pulp, but it is possible that it will later manufacture paper. It is hoped to begin construction early in the year.

In addition to its lumber activities extending along the Pacific Coast, the Charles R. McCormick Co. owns and operates a coastal and inter-coastal steamship service between the principal Pacific Coast ports of North and South America.

With the operation of its second papermaking machine, the Columbia River Paper Mills Co. of Vancouver, Wash., has increased its capacity to 70 tons a day. The main product of this plant is wrapping paper, but the new machine is being used principally for the manufacture of fruit wraps.

The Crown-Willamette logging camp at Cathlamet, Wash., was badly damaged during recent heavy rainstorms which destroyed part of the machine shop, five homes and two bunk houses. It was necessary to shut down the camp earlier than usual on this account.

Electrochemical Plant for Tacoma

Announcement is made of the organization of the Tacoma Electrochemical Co., with a capital of one million dollars. A chemical plant will be erected for the production of liquid chlorine and caustic soda; later other products.

The Pennsylvania Salt Manufacturing Co. of Philadelphia, will hold all of the capital stock of the new company, and will provide funds for construction and operation.

A large plot of ground has been secured within the limits of the city of Tacoma, which offers unusual facilities for shipment both by rail and water. Preliminary plans have been made, and after revision, construction work will be rushed. It is expected the plant will be in operation by spring.

Miami Valley Superintendents' Meeting

The Miami Valley division of the Superintendents' Association held an interesting meeting in Hamilton, Ohio, on Saturday, November 26. There seems to be no end to the big things this division is doing to promote interest and enthusiasm among its members. The program committee has been fortunate in securing good speakers for their meetings and others are on the list. Fred. J. Rooney, national president, is planning to visit the division at their next meeting, which will be the third Saturday in January.

The November meeting was presided over by H. H. Latimer, chairman, who called on C. H. R. Johnson, secretary, to read the minutes of the previous meeting and also a report of finances.

Mr. Latimer followed and outlined plans for a big membership drive. In his talk he drove home the point that every member should do everything in his power to get new members. "It is the general impression that to become a member, it is necessary to be a superintendent, but that is not the case. If a man has a number of men working under his supervision, or if he is a department head over the machines, beaters, finishing, engineering, etc., he is eligible to membership."

Robert L. Eminger, national secretary, discussed the meeting of the executive committee, held in Pittsburgh, November 6. He stated, "In all the experience I have had so far, the meeting at Pittsburgh was one of the most interesting ever

The Paint Purchase that "Carries Through"

ECONOMISTS say that America solves its production problems admirably, but is often crude and wasteful in distribution methods.

To avoid this criticism, we have done more than make Vorcolite a fine paint. We have provided a sure, simple, economical method for getting it on your wall at the lowest finished cost you can possibly attain. Here are the steps!

First, *Buy this fine oil paint.* Vorcolite is a richly pigmented flat white of great covering value, made especially for gun application.

Second, *We loan equipment,* shipping our high speed, economical, trouble proof Vortex Equipment, for use while applying the paint.

Third, *Your labor does it.* An unskilled "handy man" with our equipment does more and better maintenance painting than a whole squad of brush painters.

Painting Equipment is Loaned

Our long continued relations with hundreds of America's largest industrial concerns is your surest guarantee of satisfaction with

Vorcolite

and the VORTEX PAINTING METHOD

Get Vortex check sheet for accurate estimate by filling out coupon and remailing to

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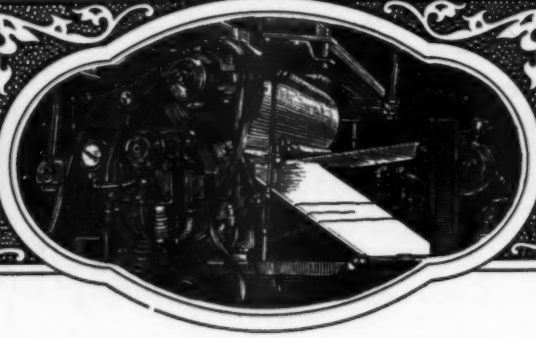
1981 West 77th Street · Cleveland, Ohio

Fill out and mail

VORTEX MFG. CO.
West 77th St., Cleveland, Ohio
Please send us check sheet to outline our painting problem. It is on new construction? _____ Buildings already in use? _____
Company .....
Address .....
Attention .....

V-40

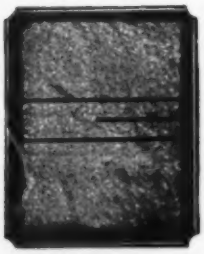


It required 69 years to make these felts

Many changes in the paper industry have taken place since Shuler & Benninghofen made their first felt in 1858. They made a good felt in those days, as good as it was possible to make.

But the felts they make today are immeasurably better—they embody all the experience gained in the 69 years which have elapsed.

It is this experience that dictates the character of a Hamilton Felt of today. It decides the mixture of the wool, the construction of the warp and woof, the method of carding, of combing, and all the other operations entering into the making of a felt.



Hamilton Felts are marked by two blue lines full width of the felt and by one shorter blue line midway between them.

And it produces felts that run longer with less down time for washing; that take out more water so that there is less sweating to be done in the dryers, and that deliver a stronger sheet to the dryers.

Try a Hamilton the next time you need a felt. It only takes a single trial to convince you that there are Felts and there are Hamilton Felts—that the Hamilton is the one you will want to use.

Ask the Hamilton Felt Man who calls on you. He is a practical felt man and will give you felts that suit your individual needs exactly.

SHULER & BENNINGHOFEN, Hamilton, Ohio

The Miami Woolen Mills, Founded 1858
HAMILTON, OHIO

Hamilton Felts

held. In selecting a city for our spring convention, several places were suggested. However, after much thought and discussion, Pittsfield, Mass. was selected, and a tentative date set, May 31, June 1 and 2. We have since been advised by the hotel in Pittsfield that they would not be in a position to give us best accommodations at that time because of Decoration Day, at which time they receive many tourists. As the Connecticut division will have charge of these affairs, they will make the final arrangements and change the date if necessary."

The next regular meeting of the Miami Valley division will be held in Hamilton, Ohio, January 21, at the Hotel Anthony Wayne. The entire program and entertainment will be sponsored by the Black-Clawson Company, Hamilton, Ohio, and Shartle Bros. Machine Company, Middletown, Ohio. This will undoubtedly prove interesting as both companies are well-known and top the list in their line of manufacture.

All members who have problems and difficulties they would like to bring before the meeting—for instance, alum, beating, finishing, etc., are asked to send a note in advance of the meeting to the secretary of the division, C. H. R. Johnson, in care of The Beckett Paper Company, Hamilton, Ohio.

C. P. Folsom, president of The Dayton Beater & Hoist Company, Dayton, Ohio, was introduced and presented a paper on "Beater Design." He was followed by F. M. Gloyd, of A. A. Simonds-Dayton Company, who presented a paper on "Beater Tackle," that had been prepared by Herbert Simonds of that company. Both papers were very interesting and received a careful hearing.

Registered in attendance at the meeting were the following: Ross Auvil, H. H. Harrison, **Crystal Tissue Co.**, Middletown; M. L. Barker, A. H. Barlow, I. M. Deck, W. W. Galloway, Lee Shroads, **Hagar Straw Board & Paper Co.**, Cedarville; A. P. Allison, F. M. Gloyd, Frank Meily, **A. A. Simonds-Dayton Co.**, Dayton; Edw. H. Butterfield, John Ditmyer, Jack Smith, Sr., Jack Smith, Jr., **Gardner-Harvey Paper Co.**, Middletown; C. R. Crawford, H. D. Martindale, **Shartle Bros. Machine Co.**, Middletown; W. H. Cunningham, **Mead Pulp & Paper Co.**, Dayton; V. Friedrich, Jr., C. H. R. Johnson, H. H. Latimer, A. J. Wildman, Jr., **Beckett Paper Co.**, Hamilton; Robert L. Eminger, Miamisburg; Jas. M. Fallon, Harry Ross, **Beveridge Paper Co.**, Indianapolis, Ind.; H. C. Ferguson, Arthur F. Gardner, Frank Hixon, K. L. Jackson, A. C. Mack, Roy W. Maggart, C. L. McKasson, James Ramsey, A. O. Rolfe, Chas. Soule, R. C. Warder, **The Champion Coated Paper Co.**, Hamilton; Olav Flatland, Lawrence Story, William C. Worst, **Container Corporation of America**, Chicago; C. P. Folsom, **The Dayton Beater & Hoist Co.**, Dayton; J. R. Hartman, R. G. Wolfinger, **Union Gas & Electric Co.**, Hamilton; A. Hess, **Fibre Conduit Co.**, Richmond, Ind.; Allan Hyer, **Black-Clawson Co.**, Hamilton.

Crystal Co. Makes New Tissue

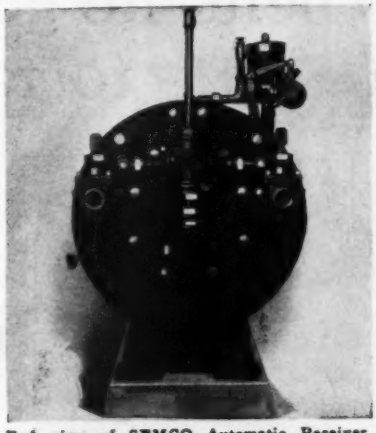
Crystal Tissue Paper Co., Hamilton, O., has added a new tissue to its line, which is as yet unnamed, primarily because no name seems adequate for this product of real character.

This product is expected to add lustre to the Crystal name, and in order to find a name for it, the company has offered a prize of $50.00, to the paper merchant or employee of a paper company, whose suggestion is received not later than December 10th. This tissue has been made to meet the growing demand for a better, stronger tissue which will sell readily among high-grade department stores, and manufacturers of quality goods.

The Strathcona Paper Co., of Strathcona, Ont., have had a good year, and their tonnage is running ahead of that of 1926. The firm reports that 1927 will see the highest production they have made since starting to make boxboard. They are installing a power plant to manufacture their own electricity with a 385-lb. pressure boiler and a steam turbine connected to a generator, so that the firm will be able to use the exhaust steam for running their paper machines and for drying their paper, as well as using it in the beater room.

L. L. Brown Paper Co., Adams, Mass., has appointed The Whitney Paper Co., Wichita, Kans., as its agent in that territory.

"Nothing Inside But the Float"



End view of SEMCO Automatic Receiver pump showing operating mechanism.

SEMCO Automatic Receiver Pump

Advantages:

Stationary Receiver, eliminating trunions, bumpers, weights and dash pots.
All adjustments made at factory.
Piston controlled vent and pressure valves.
Quick action of valves eliminates wire draw.
Valve operating piston, float controlled.
Hercules heavy duty float eliminates float trouble.
All valves and operating mechanism outside.
As positive in its action as the steam engine.
Quick action, large capacity.
Cannot air bind.

for:

Pumping Your Condensate
Draining Your Dryers
Feeding Your Boilers

Operation:

The pump is designed so that steam or compressed air may be used to discharge condensate from receiver. As the receiver fills, the float within actuates an operating mechanism on the outside of tank which admits high pressure steam or air into receiver, thus discharging condensate. Only such pressure is used to discharge condensate as is required to force it out of receiver. When the volume of the condensate has been lowered to the sealing level, the float again actuates the operating mechanism closing pressure valve and discharging pressure within the receiver, thus allowing receiver to refill.

Stebbins Engineering & Mfg, Co.

WATERTOWN, N. Y.

No belts-no gears-no extra bearings to take care of!

Nash Hytor Vacuum Pump, direct connected to slow speed synchronous motor.

One thing about the Nash Hytor Vacuum Pump that appeals to many engineers is that it can be direct connected to slow speed synchronous motors. The rotor of the motor is mounted on the same shaft as the pump impeller.

This set-up is more compact, also more efficient than belted, geared or chain driven equipment. Also easier to take care of. Belts and their costly maintenance are avoided. So, too, gear adjustments and replacements, and the extra bearings called for by other types of drive.

NASH ENGINEERING COMPANY
161 Wilson Road So. Norwalk, Conn.

New England Representative
Mr. G. H. Gleason, Nottingham Bldg., Copley Square, Boston, Mass.

Western Representative
Mr. T. H. Savery, Jr., 80 E. Jackson Boulevard, Chicago, Ill.

Nash Hytor
VACUUM PUMPS AND COMPRESSORS

PRESSURE PIPE THAT NEVER BURSTS
Built in sizes 1 inch to 48 inches

WYCKOFF WOOD PIPE

The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for White Water, Paper Stock, and Acids that can be obtained

WRITE TODAY FOR CATALOG AND PRICES

A. WYCKOFF & SON COMPANY
1855 Elmira, N. Y., U. S. A. 1927

THE JOHNSON FRICTION CLUTCH

Superb Clutch for All Paper Machines *Write for Catalog "P. I."*

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

FOSTER WHEELER

FRACTIONATING TOWERS HEAT EXCHANGERS
STEAM JET AIR PUMPS SUPERHEATERS
TUBE STILLS VACUUM PUMPS
WATER COOLED FURNACE SURFACES
BRASS AND COPPER TUBING AND PIPE

AERO UNIT COAL PULVERIZERS
AIR HEATERS CENTRIFUGAL PUMPS
CONDENSERS COOLING TOWERS
ECONOMIZERS EVAPORATORS
EXPANSION JOINTS FEED WATER HEATERS

FOSTER WHEELER CORPORATION, 165 Broadway, New York
Works: Carteret, N. J.; Dansville, N. Y.; Newburgh, N. Y.

Atlanta, Birmingham, Boston, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Kansas City, Los Angeles, Milwaukee, New Orleans, Pittsburgh, Philadelphia, Salt Lake City, San Francisco, London, Engl.

WISCONSIN NEWS

New Fibre Box Plant

The Menasha Wooden Ware Corp., Menasha, Wis., one of the largest manufacturers of tubs and pails, has found it necessary to enter the fiber box manufacturing field in order to meet modern requirements. While there will probably be a demand for wooden containers for certain products for a considerable time to come, many products are more adaptable to fiber containers, and there is, of course, a great saving in shipping costs.

A new reinforced concrete building, four stories high has been erected, and machinery is being installed. R. L. La Rue of Morristown, N. J., a man of long experience in the fiber box industry, will be in charge of the department.

Chester C. Shepard, district sales manager of the Northern Paper Mills, Green Bay, Wis., passed away recently in Pittsburgh, Pa.

As a part of its conservation program, the Nekoosa-Edwards Paper Co., Port Edwards and Nekoosa, Wis., recently placed 200,000 additional rainbow trout in Nepco Lake, the body of water impounded by the company's new dam. About a half million fry have been planted by the company this year. The project has been warmly praised by the State Conservation Commission.

Kimberly-Clark Co., Neenah, Wis., has engaged the services of A. T. Hudson, director of the Kaukauna Vocational School, for educational work in the Kimberly plant.

William E. Nash, Sr., sales manager of the Nekoosa-Edwards Paper Co., Port Edwards, was seriously injured in an automobile accident near Princeton, Wis. His condition is reported as considerably improved.

Construction of a high tension line between Green Bay and Stevens Point by the Byllesby Engineering Co. will connect three large plants in northern Wisconsin and supply a number of paper mills. The project will cost about $1,500,000. It will be a help to industries suffering from low water conditions as they will be tied up with the large steam plant in Green Bay operated by the Wisconsin Public Service Corp., a subsidiary of the Byllesby interests.

The service of John Kramer, who has retired after forty-four years of employment by the Marinette and Menominee Paper Co. of Marinette, Wis., was recognized and rewarded recently when the company presented him with a purse. He had previously never missed a day because of accident or illness.

A tug used by the Consolidated Water Power and Paper Co., of Wisconsin Rapids, Wis, for transporting pulp wood from Canada over Lake Superior to Wisconsin ports, was storm bound for several days on the lake, but it survived the blizzard. It was the last haul of the season.

Having applied for a new permit for reconstruction of their dam, and in doing so complying with the recapture clause of the Wisconsin water power act, the Fox River Paper Co. and associated concerns is replacing the wooden structure with a concrete one. The state railroad commission may fix a value of the property at which price the state may acquire it after thirty years. A dispute of this right was lost by the applicants recently in a decision by the United States Supreme Court. Whether the commission should assign value to flowage of water was not touched upon by the court, and this point may be contested. Such assignment would considerably enlarge the worth of the power property.

Work has been started on the rebuilding of the wood pulp conveyor of the Flambeau Paper Co., Park Falls, Wis., which

In Selecting

Bristol's

Recording Instrument Equipment

You have the assurance that each instrument is designed especially for the work to be done, thus providing a service that's correctly suited to the particular needs of your plant.

for example

in securing more economical burning of Sulphur ... use the accurate guidance of

Bristol's Recording Pyrometer

The Bristol Company Waterbury, Connecticut

FOR 38 YEARS MAKERS OF

BRISTOL'S RECORDING INSTRUMENTS

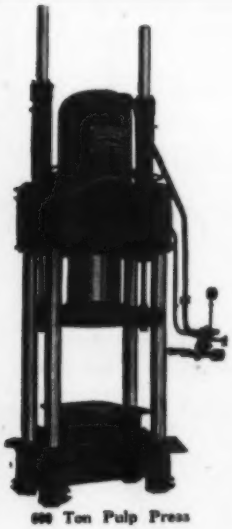
Wood Tanks of All Kinds

We build round tanks in a great variety of diameters and heights ranging in capacity from 25 gallons to upwards of 125,000 gallons. We are equipped to build special tanks of all types for use in the paper industry.

Our engineering department will assist you and advise you concerning Acid Towers, Stave Pipe, and Wood Tanks of All Kinds.

THE A. T. STEARNS LUMBER CO.

NEPONSET BOSTON, MASS.



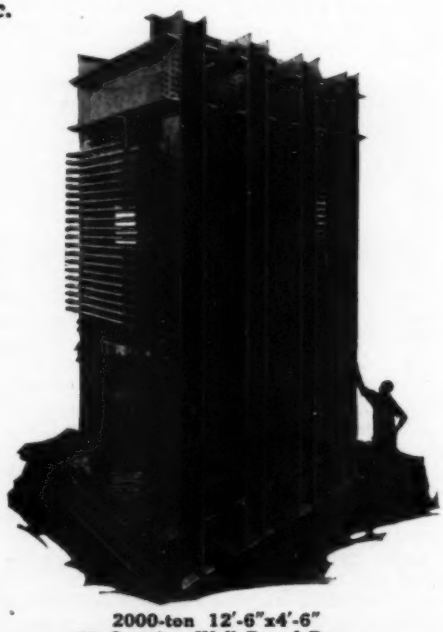
600 Ton Pulp Press

SOUTHWARK

Hydraulic Equipment for Pulp and Paper Mills, Wall Board Plants, Etc.

PULP PRESSES
BALING PRESSES
WALL BOARD PRESSES
PULP TRUCKS
HYDRAULIC PUMPS
ACCUMULATORS
VALVES, FITTINGS, ETC.

Southwark Hydraulic Equipment is the choice of the largest and best known Pulp and Paper Mills throughout the country. They find Southwark products give the most efficient service under exacting conditions. Write for Bulletin No. 14.



2000-ton 12'-6"x4'-6" 20 Opening Wall Board Press

SOUTHWARK FOUNDRY and MACHINE CO.

400 WASHINGTON AVENUE
PHILADELPHIA, PA.

CHICAGO
343 S. DEARBORN ST.

AKRON
100 E. SOUTH ST.

was destroyed by a heavy wind some time ago. In rebuilding the conveyor, the company is lessening its former height by ten feet to avoid a recurrence of the recent damage.

Ernest Pashek, an employee of the Peshtigo Paper Co., Peshtigo, Wis., recently suffered painful burns from acid when a pipe burst at his feet while employed in the mill.

Approximately 30 employees of the Consolidated Water Power and Paper Co., of Wisconsin Rapids, have enrolled in a course in paper and pulp manufacture conducted by the Wisconsin Rapids Vocational School under state supervision. Lyman Beeman, superintendent of the ground wood department, is one of the instructors.

Lake Superior Paper Co., of Ashland, Wis., one of the mills involved in the merger of the Marathon Paper Mills Co., of Rothschild, and the Menasha Printing and Carton Co., Menasha, Wis., has discarded its old name and will now be known as a plant of the Marathon Paper Mills Co.

NEW ENGLAND NEWS

American Gets Money Paper Contract

An even greater surprise to many in the paper trade was the American Writing Paper Co.'s award of a substantial money paper contract beginning July 1st, 1928. Last spring it was announced that a group of fine papermakers, including the Cranes, had conferred with Treasury department officials with a view to submitting bids for new money paper contracts, including the large new dollar bill award. Few supposed that there would be any change in the Government's policy of awarding the business to the Cranes who having had it for two score or more years and having skilled workmen familiar with its technical process could not be displaced Moreover, the Government mill at Dalton is rigidly guarded and many special precautions are taken to prevent detection. It was thought unlikely that the expense involved in so safeguarding manufacture at a new mill would prevent any shift. But it now develops that Collins Mfg. Co., of North Wilbraham have also obtained part of the current year's contract. It is believed that 200 tons of the special paper are involved which may mean the resumption of operations at the Holyoke division and the employment of an additional 100 men. President Willson, returned from a western tour about the time that the mail brought word of the Government decision and steps were immediately taken to put the Holyoke division in shape for these operations. American Writing Paper Co. has been experimenting for two years under the direction of vice president L. M. Yoerg, with the view of securing part of this contract. In the recent bidding their price was too high but their samples tested extraordinarily well and it is on this basis that the award was made.

Incidentally, Mr. Willson was confident that American Writing Paper Co. business will improve in all departments next year and found the company's selling position sounder in the Middle West than ever in its history with constant improvement manifest.

Whiting Paper Buys Lyman Mills

Purchase of the Lyman mills, a large textile property in Holyoke, by the Whiting Paper Co., is the outstanding development of the past month, coming as it did on the heels of the improved operating reports from Holyoke mills. William Whiting announces that the entire plant of the Lyman mills cotton manufacturers whose decision to close down their Holyoke property caused such widespread gloom in the Paper City, has been purchasing for papermaking. Mr. Whiting was questioned as to whether he contemplates the removal of his New York converting plant to Holyoke, but he refused to state the company's intentions in that respect. Besides the main property there are two large storehouses and land enough for

Dependable Wire Clothing

Every possible precaution is taken to make sure that Cheney Bigelow Wire Clothing shall be dependable.

Only the highest grade materials are used. The wire is drawn with precision and very carefully annealed, it is frequently tested for quality and size.

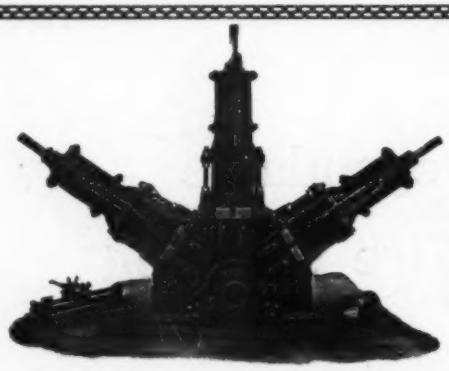
The weaving is extremely accurate, the finished cloth is uniform and firm, and always inspected with minutest care before shipment.

For Fourdrinier or Cylinder machines Cheney Bigelow Wire Clothing is always dependable.

Cheney Bigelow Wire Works

Established 1842

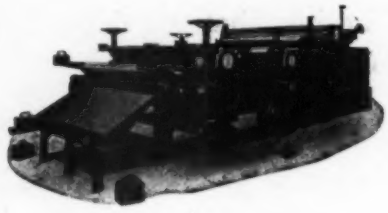
Springfield, Mass.



Standard Wood Pulp Grinder

Built in Three Sizes

Taking wood 24", 30" or 32".
Bridge-trees—Are well proportioned.
Flanges—Made of steel, 40" diameter.
Hydraulic Cylinders—Copper lined, 12", 14" or 16" diameter. Valves are quick acting and leak proof.
Pillow Blocks—22" length of bearing.
Pockets—Very heavy, designed particularly for free discharge of pulp, and fitted with our RENEWERS.
Service—Continuous distinctive service is always assured.



Rogers and Special Wet Machines

The standard machine for producing high density laps continuously.

When dry stock is not desired, use it as a labor saver—one man can run it and handle a tremendous daily capacity.

The Single Press may be used for the same purpose.

A true Glens Falls product, our new

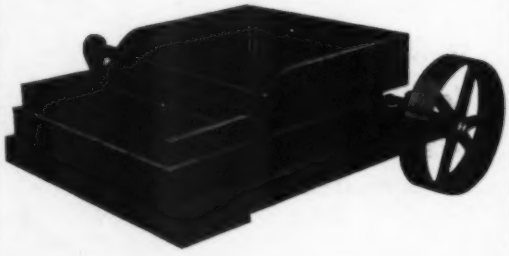
DEWATERER

(Patent pending)

Efficient Simple

This long sought machine will deliver chemical pulp from 15% to over 25%, as you may desire. It is entirely self contained, requiring no prethickener or vacuum pump. The flake form in which the stock is delivered is ideal for bleacher, beater or storage. Figures of our trial run are available at your request.

We have an attractive offer to make to you—you take no risk



Wells Undulating Knot and Sliver Screen

Gentle action assures high quality.

Simplicity means low upkeep and low selling price.

And you can SEE it all the time.

Ask Us for Quotation and Recent Purchasers

PULP AND PAPER MILL MACHINERY
GLENS FALLS MACHINE WORKS

GLENS FALLS, NEW YORK

See pages 343 to 345 in the 1927 Paper and Pulp Mill Catalogue

indefinite expansion. There is a new turbine power plant, water wheel power and an older steam power house. The Lyman mills were assessed at $3,500,000 but the price for them was not made public.

Mr. Whiting states that fourdrinier machines will be installed and orders for these are to be given immediately. The purchase included the textile machinery but this will all be sold when contracts for cloth are completed which will probably be around the end of February. It has often been remarked in the fine paper trade that the Whiting interests were missing an opportunity in not purchasing some of the cheap mill property in Holyoke for their converting plant. As one of the largest manufacturers of fine stationery paper and fine stationery in the world, it has often been said that the high rents and high labor costs involved in a 14th street location on Manhattan Island should prompt them to give more attention to making paper products near their mills.

But whether or not stationery is turned out in the Lyman property, more paper will certainly be made, in fact Mr. Whiting predicts that his enlarged company will be the largest manufacturer of high grade stationery paper in the world. Many interests had sought the property but it was rumored for some time in the paper trade that the Whiting interests were particularly anxious to secure it if a favorable price could be agreed upon.

A new line of paper makes its appearance on the market from Worthy Paper Co., Mittineague, this month. It is called "Signature" and is a high grade rag sheet inlaid and wove, offering users the opportunity of cutting from a high grade 23x34 stock size. This provides for the writing paper size, 22x34 and the book and cover paper size 23x33 with a minimum of waste. There are three weights and pasted sheets. It is shown in use for signature and special booklet work of unusual beauty.

The Hurlburt Division of the American Writing Paper Co., which had been segregated among the so-called Choral Properties, Inc., has been sold to a group of Pittsfield and New York men. It has been incorporated under Massachusetts laws. W. J. Ingram, manager of the plant before it closed is to return from Holyoke and superintend operations. The buyer is Paul Z. Zuhlke of New York, who is president. Nelson Foot of Pittsfield and Miss E. W. Wilson of Lenox, Mass., are directors. The mill has a capacity of about 8 tons of fine writing paper and much modern equipment.

Permanent Berkshire Receiver

A. D. Naylor of Springfield, has been confirmed as permanent receiver of the Berkshire Hills Paper Co., of Adams, Mass. He has taken possession of the property, its books and all assets. He was authorized to borrow $20,000 for immediate expenses.

H. L. Harrington, temporary receiver, was opposed by many creditors and it was their testimony at hearings in Boston and Pittsfield that determined the court's confirmatory action. Mr. Harrington's report filed in October showed small profits during each month of the receivership with but one machine making high grade loft dried papers in operation. The coarse paper machine for tissue has been down. The last net gain in assets was $5065 after bond interest of $3200.

Efforts by the Bellows Falls Chamber of Commerce to secure abatement of taxes and the fact that the damage to the Babbitt Kelley Paper Co., mill was not so completely destroyed as was first reported have induced owners of the mill to rebuild and restore the property. One wall was completely washed away, and recently purchased machinery was swept away. Engineers have assayed the damages and submitted plans and costs for rebuilding.

While plans have been pushed with vigor by New England capitalists, through the New England Council to speed restorative measures in Vermont, these have been directed chiefly towards farming property, replacement of homes and

TANNATE WATERSHED

TANNATE LASTED FIVE TIMES AS LONG AS RUBBER ON A JORDAN

A WISCONSIN company began using Tannate Belting about a year ago. They now have a 3-inch light double governor belt; an 8-inch heavy double on rewinder; two 12-inch heavy doubles on beaters, and a 13-inch heavy double on a Jordan.

The report says, "Well pleased with all of them, especially the 13-inch on the Jordan—a cross belt."

They had been using 14-inch 8-ply rubber belts on the Jordan. These seldom lasted more than three months. The Tannate has been on fifteen months and "promises to run for years."

Rhoads Tannate Belts, with their great strength and unusual grip, are real trouble savers in paper mills.

They will run in water. They are economical.

They are always sold under the Rhoads Service Guarantee.

Use Rhoads Tannate Lace Leather
It outlasts rawhide three to five times

J. E. RHOADS & SONS

PHILADELPHIA .....47 North Sixth Street
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CENTRIFUGAL PUMPS FOR THE PAPER INDUSTRY

The Bethlehem Horizontal Centrifugal Pump is of the double-suction, single-stage type with horizontal split casings. Capacities 200 to 17,000 gallons per minute against heads of 20 to 250 feet.

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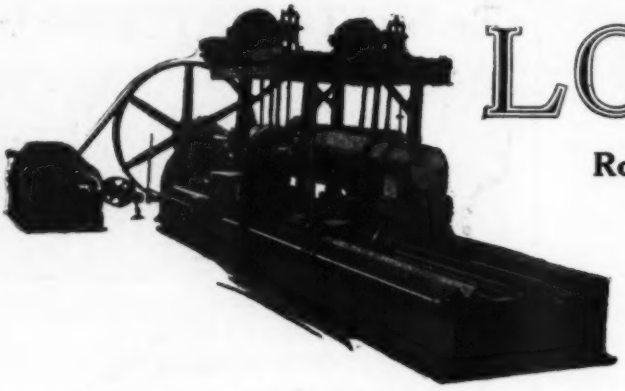
New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland, Detroit, Cincinnati, Chicago, St. Louis, San Francisco, Los Angeles, Seattle, Portland

BETHLEHEM



LOBDELL

Roll Grinding Machines

Full Motor Driven
Rapid
Accurate
Long Lived

The automatic crowning device and the provision for leveling the bed are exclusive features of the Lobdell Roll Grinders.

The design and operation are fully described in our booklet "Grinding, Care and Upkeep of Paper Mill Rolls."

LOBDELL CAR WHEEL COMPANY

Established 1836

WILMINGTON, DELAWARE

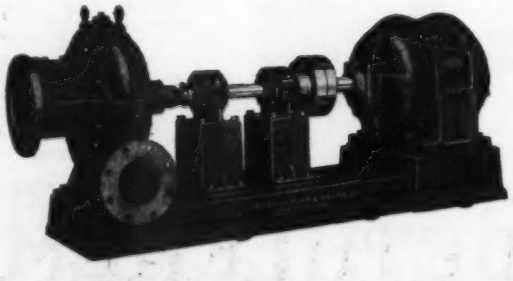
Here is a

Stock Pump

Developed by Paper Mill Pump Specialists to handle stock up to 5% consistency and over, with unusual efficiency.
It is a "BALL BEARING PUMP" with the ball bearings mounted in horizontally split housings which are widely spaced to give smoothness and stability in operation. Notice the HORIZONTAL SPLIT CASING and large hand hole in suction. NON-CLOGGING IMPELLER.
Ask for circulars and let us consider your requirements.

Lawrence Pump & Engine Co.

P. O. BOX 70,
LAWRENCE, MASS.
or 90 West St., New York.



Quaker Hose for Paper Mills

Our Water Hose is made to meet the special requirements of paper mill operation.

It is built with a tough cover to withstand wear of dragging, and a tube of unusually high quality rubber.

Quaker Paper Mill Hose can be furnished with a tapered rubber nozzle, made to prevent damage to the screens.

Furnished in ¾" and larger sizes.

QUAKER CITY RUBBER CO.

Wissinoming, Philadelphia.
Branches: New York, Chicago, Pittsburgh, San Francisco

Lift Electrically

Why pull, tug, strain and waste your time with slow lifting methods, when the ROEPER TYPE "R" Electric Hoist will do the work twenty times as fast. The price is surprisingly low. Send for Bulletin.

Roeper Crane & Hoist Works, Inc.

1724 N. 10th St., Reading, Pa.

like projects. The Vermont Flood Relief Corp. is a corporation to be formed through the council, which will have $1,000,000 of stock subscribed to by New England interests to aid Vermont industries.

The Parker Young Co., have given a contract to a western Massachusetts firm for the rebuilding of their destroyed penstock at Lincoln, N. H., carried away in the flood last month. Though the mill is operating, direct rail facilities are not yet completed. Meantime, much of its paper is being carted to Plymouth whence it is shipped by rail. Damage to the power plant did not completely stop operations as a steam auxilliary has been utilized and one machine kept in service.

The Missquoi Pulp & Paper Co., was able to maintain operations with little damage to its mill by prompt work, and through routings via the Canadian lines and the D. H. has kept its paper moving. The Central Vermont R. R. serving it directly in conjunction with the B. & M. to Boston, will probably not be restored to service before spring in the opinion of Boston traffic men.

Strong opposition was voiced by C. L. Whittemore of the New England Paper & Pulp Traffic Ass'n to the petition of the St. Regis Paper Co. and others, for lower rates to Chicago. The Great Northern Paper Co., has also intervened in the case of the Watertown manufacturer. The present newsprint rate of 38.50 cents from Maine to Chicago via the differential lines is the same as Watertown, while the printing paper rate is but 3 cents more than the corresponding New York state rate.

Charles Sumner Bird, late president of Bird & Son, left some $12,300,000, which will be administered for a period by Philip R. Allen, newly elected president of Bird & Son, George D. Dutton and Harold Twombly. Charles Sumner Bird Jr., has been elected a director of the Company.

Mystic Terminal Co., subsidiary of the Boston & Maine R. R., has announced to the china clay and paper manufacturing trades that it anticipates the setting up of pneumatic machinery for the unloading of china clay early in January, and will invite inspection by interested persons at that time. The company expects to perform continuously with the new machinery unloading about 1000 tons per 8 hour day with the four units. Twenty-four hour operations will be possible as overtime wages are more than offset by greatly reduced amount of labor required. The machinery which is now being delivered will eliminate loss in movement from the hold to the cars. The clay is unloaded onto a box car loader, thence to the cars.

Operating conditions in Holyoke are reported improving. The converters have enjoyed 100 per cent operations for several months in a heavy holiday business. American Writing Paper Co., reports round 80 per cent of capacity and several independents among them, Parsons, Whiting, Crocker McElwain and Valley Paper Co., are on 100 per cent schedules.

Strathmore Paper Co., has just offered to the trade a new line of everyday deckle edge paper, priced for frequent use in many forms of printing, lithography, Ben Day work, embossing and, of course, for general advertising. The colors are eight in number and are subdued in tone. The name of the paper is "Saxon" deckle edge cover.

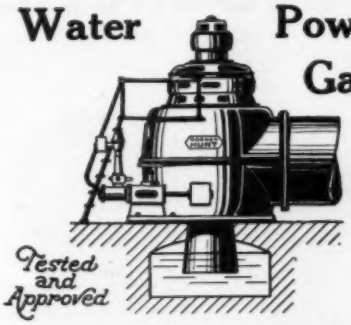
Boston Paper Trade Ass'n Meets

The Boston Paper Trade Ass'n held its annual fall meeting at the Boston Exchange Club, Nov. 16. About 100 members and guests enjoyed the occasion which included a varied program. Following the banquet Franklin Collier, a noted Boston humorist and cartoonist, sketched a dozen distinguished members, exaggerating facial features and personal habits to the delight of the audience.

Robert H. Tait, a prominent Newfoundland soldier, game hunter and chief of the Boston publicity and trade bureau for

RODNEY HUNT

Think What this Offers to YOU in Water Power Gains



93.38%
EFFICIENCY
AT THE HOLYOKE TESTING FLUME
HOLYOKE, MASSACHUSETTS

The recent unprecedented efficiency shown by a RODNEY HUNT-BIGGS Water Turbine

Increase is brought about by greater turbine efficiency, elimination of transmission losses, reduction of upkeep expense, and automatic control.

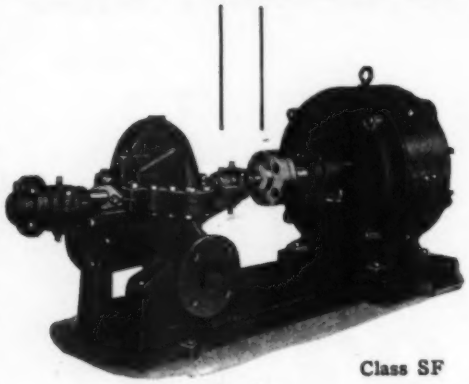
Horizontal and Vertical Replacements a Specialty

RODNEY HUNT MACHINE CO.
38 River St. Orange, Mass.

RODNEY HUNT

The Experience of 50 Years is of Value to You

Maintaining the Steady Flow of Production for a PROFIT

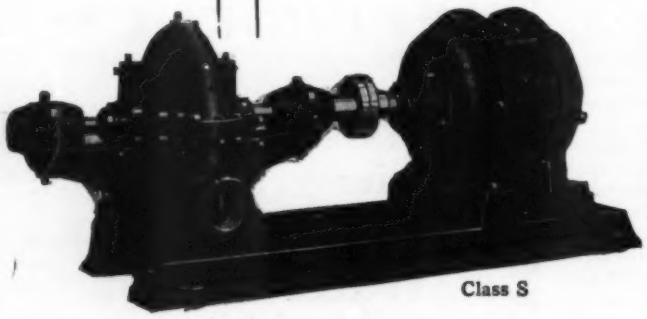


Class SF

Is it costing you more than it should to handle your paper stock—supply the process water—convey digester liquors—feed your boilers?

In these days of "Prosperity without Profit" due to the decreasing margin between selling price and cost, it is increasingly necessary to check up costs at every step. And your pumps can make a big difference in the showing of your weekly report sheets.

How well "Buffalo" Pumps meet these present day requirements is shown by the fact that a prominent paper company has just added 13 more—making a total of 41 in use by the one company.

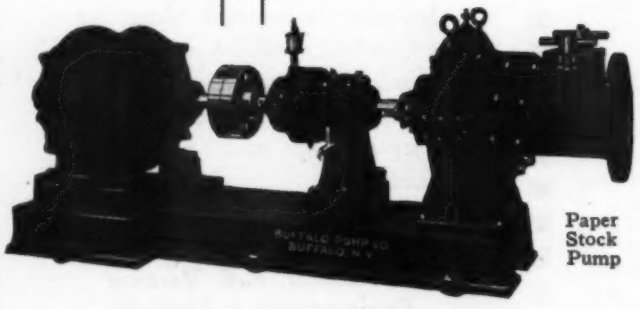


Class S

Efficient—Dependable

The careful design of water passages, double suction impellers, clearance rings, and bearings gives unusually high efficiencies and reliable service.

Buffalo Paper Stock Pumps are positively non-clogging.



Paper Stock Pump

The Right Pump for Each Purpose

"Buffalo" not only carries a complete line of all types and sizes, both steam and centrifugal, but also designs special pumps to meet unusual conditions. Engineering offices in principal cities are at your service, in selecting the proper units.

Write for Bulletins

Buffalo Steam Pump Company

213 Mortimer St. **BUFFALO, N. Y.**

In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

the Dominion, lectured on his native land with the aid of vivid moving pictures. He touched on the International Paper Co.'s great development at Cornerbrook recently acquired. He intimated that expansion would take place at that plant and that the I. P. Co., was exploring the recently acquired Newfoundland lands on the mainland beyond Labrador, obtained by decision of the Privy Council from Canada.

Norman Narrower, president of the association, closed the evening with a reel of movies taken at the association outing last June at Charles River Country Club. Three new members were elected, Hartley Hurlburt, Hurlburt & Hatfield of Boston, Graham Blandy, Charles A. Esty Paper Co., of Worcester, and Philip R. Allen, newly elected president of Bird & Son.

Reynolds Mfg. Co., of Holyoke, paper converters, and specifically stationery manufacturers, have expanded their business materially by the acquisition of a plant formerly occupied by the New England Tire & Rubber Co.

Despite a quiet summer, the fine paper industry of New England is showing excellent production for the year and will easily exceed 1926 it is understood. According to statistics compiled by the Massachusetts Department of Labor and Industries, paper and papetries to the value of $33,628,000 was the 1926 total output of Holyoke.

White & Wyckoff Mfg. Co., of Holyoke paper converters, have equipped their new plant with necessary machinery and have greatly increased their output.

The legislature of Vermont in emergency session passed a flood relief bill appropriating $8,500,000 for the assistance of various districts, part for loans to small independent railways, part for industries, and part for road repair and individual aid.

The case of the Haverhill paper stock dealer against the Paper Industries Ass'n, Bird & Son Inc., Robert Gair & Co., Chemical Paper Mfg. Co., and others has been continued in the Salem Superior Court for Essex County. This dealer claims a black list has been used against him by the consumers and alleges anti-trust law violations by the association.

Catalogues, Books and Publications

American Hoist & Derrick Co., St. Paul, Minn.—"American Gasoline Three-Speed Crane", outlines the construction features of the gasoline crane. Views are shown of the machine in action and mention is made of the general features, such as revolving mechanism, gib ring instead of king pin, revolving deck, car body and trucks and universal joint transmission. One page is devoted to frictions. Copy may be had upon request.

American Blower Co., Detroit, Mich.—An interesting bulletin No. 1124 describes by illustrations, installations and operation of the "Sirocco Collector", an apparatus for collecting fly-ash and coal dust. A list of installations in the United States and abroad is given.

The Bristol Co., Waterbury, Conn.—This company has just issued Bulletin No. 362, entitled "Bristol's Recording Instruments in the Power Plant." Explanatory drafts are given, also illustrations of different types of pressure gauges, water gauges, thermometers, humidity recorders, tachometers, voltmeters, ammeters and motion recorders. There is also a list of applications and instrument recommendations for the power plant. This very attractive booklet will be of interest to the power engineer.

Combustion Engineering Corp., 200 Madison Ave., New York City—An interesting booklet entitled "Aims and Tendencies in Steam Generation and Combustion Engineering" has been compiled by Martin Frisch of this company. A review is given of recent developments in the combustion field and some interesting future tendencies are predicted. There are figures of steam generating units, curves showing steam output, charts and other illustrations.

BOWSER

No more trips to the graveyard!

Gears require real lubrication; those that aren't adequately lubricated go quickly to the graveyard; occasional daubing with grease won't do.

Gears that are *thoroughly* lubricated last almost indefinitely.

And, today Bowser can offer a system for lubricating gears *thoroughly;* a system built around our Fig. 801 Lubricator-Pump, as illustrated.

With every stroke of the plunger in this pump, a predetermined amount of lubricant (grease or heavy oil) is forced into a bearing or on the gears. "Infallible lubrication"—that's exactly what this new Bowser system offers. The system is simplicity itself.

No forgetting, no waste, and no dry gears or bearings—that's the Bowser guarantee for this newly-perfected system. It is particularly adapted to the use of dryer drives and open gears.

For completely-illustrated folder and bulletins, address Dept. 3.

S. F. BOWSER & COMPANY, Inc.
LUBRICATION ENGINEERS AND MANUFACTURERS
FORT WAYNE, INDIANA, U.S.A.

LUBRICATORS-OIL FILTERS-OILING SYSTEMS-ACCESSORIES
OIL STORAGE AND DISTRIBUTION SYSTEMS

REED SPAFFORD

Pulp Screen

WHAT DOES YOUR **POWER** COST YOU

UNHEARD OF LOW **POWER** PER TON

HALF **POWER** SAVED

VERY LARGE CAPACITY

VERY LIMITED FLOOR SPACE

OFFERED ONLY AFTER MANY MONTHS OF CAREFUL DEVELOPMENT

Improved Paper Machinery Company

Nashua, N. H., U. S. A.

De Laval Steam Turbine Co., Trenton, N. J.—Centrifugal pumps, their types, designs and uses, form the subject of a copiously illustrated book distributed by this company. The final chapter of the book treats of pump characteristic curves and gives formulæ and constants useful to the pump user.

Foster Wheeler Corp., New York City—A new catalogue, EC-102, has just been received, descriptive of the Foster Economizer. This catalogue contains 48 pages and is attractively bound. The contents include a survey of the developments in economizer practice, a detailed description of the construction of the pressure parts and housing of the economizer and its simplicity of operation. Illustrations of typical arrangements are also shown and test data showing the performance of some of the economizers in service. This catalogue will be of interest to engineers working on the recovery of waste encountered in the boiler room.

General Electric Co., Schenectady, N. Y.—Bulletin GEA-822 describes ball-bearing construction as used in their AC and DC general purpose motors; also gives description of the cartridge type unit.

Technical Ass'n of the Pulp and Paper Industry, New York City—Announcement is made that R. B. Wolf's pamphlet, "The Creative Workman", which was published in 1918 and long out of print, has been reprinted and is now available at $1 per copy. (Fifty cents to members of TAPPI.)

Metropolitan Life Insurance Co., New York City—The Policy Holders Service Bureau has just prepared for the Research Committee of the New England Council a summary of business research methods and results in New England. A brief summary of their findings in specific cases has been published in an interesting booklet of 28 pages and cover entitled "Better Business Through Research in New England Industry." Instances are cited where research is used to study sales, for developing foreign trade, to improve dealer relationship, as a basis for advertising, to help formulate merchandising and marketing plans, for a better control of style and design, to evaluate modes of distribution and to help solve sales management problems. The complete findings will be published later in a series of reports.

Barrett-Cravens Co., New York City—A two-color broadside has just been issued, which contains a large number of illustrations of their various types of trucks, hoists and handling equipment.

Smallwood Stone Co., Steubenville, O.—"Modern Pulp Stone Production" is the title of a story written by W. G. MacNaughton, former secretary of the Technical Association of the Pulp and Paper Industry, which describes the author's impressions of the methods of pulp stone production as carried on in the quarries of this company, who are America's largest and foremost producers of pulp stones. To users of the famous Empire Pulp Stones, this very interesting booklet with its illustrations of quarry, finishing and shipping operations should be very gratefully received.

American Forests and Forest Products—Statistical Bulletin No. 21 prepared by the Forest Service of the U. S. Department of Agriculture, is a valuable reference book for any one interested in American forests and their products. It includes most of the general statistical tables used by the Forest Service, selected with the purpose of giving a broad view of forest conditions in the United States, and of the industries dependent upon the forests. In view of the growing need for State forest statistics, this bulletin introduces a newly compiled series of State lumber production tables, giving the complete census record for all but four of the States.

Copies may be procured from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., at 45 cents per copy.

Standards and Specifications in the Wood-Using Industries—This volume represents the first attempt on the part of the Department of Commerce to collect and publish the substance of the standards and specifications in the wood-using industries formulated by the national technical societies, the trade associations having national recognition, or other

THE claims of "long life" made for Darling Valves do not consist of idle chatter. They are based on definite, tangible elements of construction which any cautious buyer can see and touch. Take the parallel discs for example. These revolve every time the valve is operated, seating at a different place with each occasion. Surely this feature contributes appreciably to the life of a valve.

Other desirable features are renewable seats with ground-in faces. A wedging mechanism that carries discs over port and in front of seats before spreading. The largest Darling Gate Valve can be easily operated by one man without artificial aid.

Catalogues and diagrams on request

DARLING VALVE & MFG. CO.

Williamsport, Pa.

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Chicago

Oklahoma City
Houston

DARLING
GATE VALVES

If you are in the market for any used paper or pulp Mill machinery, write to us. We have at all times, good used paper machines, calender stacks, beaters, Jordans, Rotary and Flat Paper Cutters, Slitters & Rewinders, etc., etc. We also would be glad to have your list if you have any good used equipment for sale.

Address:-

Gibbs-Brower Co., Inc.

Paper and Pulp Mill Brokers
261 Broadway, New York City
Telephone—Barclay 8020
Our Motto: *"SERVICE FIRST"*

Ham Feltz sez:

"Payin' a little extra to get the best wet felt you kin find is one way to cheat the coal pile. It's cheaper to let the water run through a high grade Hamilton felt than to sweat it out of the paper with high cost steam. Check it up as I've done and you'll find it a case of only dimes against dollars."

Hamilton Felts

PAPER MILL MACHINERY

One 72" Pusey-Jones Fourdrinier Part. Takes wire 74" by 50 ft.
One 129" Hamblet duplex sheet cutter with layboy and six roll stand.
One 134" Pusey & Jones Uniform speed reel.
One 130" Moore & White four drum winder with slitter attachment.
Three Beloit triplex stuff pumps 10x20.
Two Pulp breakers, Noble & Wood, 1200 lbs.
Four beaters, Horne, 54" x 48" with wood tubs.

All above equipment in excellent condition, installed new in 1923.

51 Dryers 36" x 72" with frames, felt equipment.
One reel, two drum upright.
One 68" duplex sheet cutter, Downingtown.
One 72" Moore & White four drum winder.
Three Dayton beater rolls 66" x 60".
Two 72" Baker wet machines.
Two 3 pocket grinders with sones 54" x 27" direct connected to G. E. motor, 2200 volts, 60 cycles, 240 r.p.m.

For Sale By

FRANK H. DAVIS COMPANY

175 Richdale Avenue, Cambridge, Mass.

Pickles' Patent Automatic Steam Regulator FOR Paper Making Machines

Which absolutely control the drying of the sheet. Installed on sixty days' trial

W. F. PICKLES **Buckland, Conn.**

MAGIC BOILER PRESERVATIVE

"The Pioneer Boiler Treatment"

Positively removes and prevents scale, stops minor leaks, pitting and corrosion

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Steel Plate Construction

Steel Storage Tanks, Blast Furnaces, Gas Holders
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POWER PLANT PIPING

We are fully equipped to supply fabricated materials and to install complete piping systems for Electric Power Stations, Blast Furnaces, Steel Mills, Coke Works, Paper Mills and Industrial Plants of every description—backed by an experience of almost a quarter century.

Pittsburgh Piping & Equipment Co.

PITTSBURGH, PA.

organizations which speak for industry or with the authority of the Federal Government as a whole.

The book contains 349 pages, is well illustrated with figures, and beautifully bound. The price is $1.50 and orders should specify Miscellaneous Publication No. 79, and be sent to the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.

An Interesting New Book—"Rags"

Rags is the name of a new and interesting book published this month by twenty-nine manufacturers of rag content papers, the firms concerned being Advertisers Paper Mills-Taylor-Logan Co. Papermakers, American Writing Paper Company, Inc., The Beckett Paper Company, L. L. Brown Paper Company, Carew Paper Company, Chapin & Gould Paper Company, Chemical Paper Manufacturing Company, Collins Manufacturing Company, Crane & Co., Inc., Z. & W. M. Crane, Inc., Crocker-McElwain Company, C. H. Dexter & Sons, Inc., Esleeck Manufacturing Company, Fox River Paper Company, Gilbert Paper Company, Hampshire Paper Company, The Harding-Jones Paper Company, Hawthorne Paper Company, Keith Paper Company, Lee Paper Company, Millers Falls Paper Company, Neenah Paper Company, Parsons Paper Company, B. D. Rising Paper Company, Southworth Company, Strathmore Paper Company, Valley Paper Company, Byron Weston Company, Whiting-Plover Paper Company.

The avowed aim of the book is to indicate the difference between rag and sulphite papers and the uses to which each kind is best fitted.

Paperboard Industries Meeting

The annual meeting of the Paperboard Industries Association was held at the Waldorf-Astoria Hotel, New York City, Thursday, November 17, 1927. At this meeting, and at the group meetings held on the 16th and 17th, the following officers were elected for the coming year:

President and chairman of Executive Committee, W. J. Alford, Jr., Continental Paper Co., Bogota, N. J.

Vice-presidents—Paperboard Group, E. R. Hankins, Continental Corp. of America and Mid-West Box Co., Chicago, Ill.; Container Group, J. J. Brossard, Fort Wayne Corrugated Paper Co., Fort Wayne Ind.; Folding Box Group, H. S. Hinkle, National Folding Box Co., New Haven, Conn.

In addition to the president, who was elected by the general membership and the vice-presidents elected by the individual groups, each of which was elected a member of the Executive Committee, other members of the Executive Committee were elected as follows:

Representing Paperboard Group, Fred D. Wilson, Robert Gair Co., Chicago; representing Container Group, Irving Hill, Lawrence Paper Mfg. Co., Lawrence, Kans., and Clarence J. Schoo, General Fibre Box Co., Springfield, Mass.; representing Folding Box Group, W. H. Richardson, The Richardson Co., Lockland, O., and H. H. Stonebarger, The Globe Folding Box Co., Cincinnati, O.

GRANT GEAR WORKS

Estimates and gear advice promptly and cheerfully given

Send for Our Catalog of Stock Gears

Office and Works

Second & B Sts., Boston, Mass.

FROM "RIZMA" TO "REAM"

THE Arabic word "rizma" is the word from which our word "ream" was derived.

"Rizma," which merely meant "a bundle of paper," served for centuries as a unit of quantity. Later on, as commercial standards became more exact, "ream" came to signify a definite number of sheets.

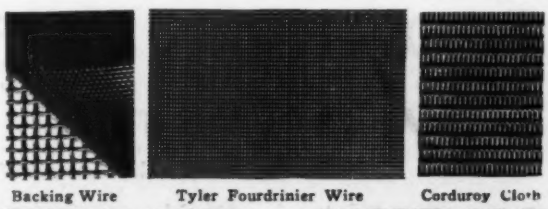
Likewise, the name Tyler, when applied to Fourdrinier Wires, has come to designate a high standard of quality as fixed and definite in meaning as is the word "ream" with reference to quantity.

The steady maintenance of this high quality in Tyler Fourdrinier Wires assures paper of uniform texture, free from wire marks, wrinkles and other defects. Tyler wires run straight and true. The tough, durable wire, the firm, double-crimped weave and the accurate mesh all add to the long continuous service.

Every Tyler wire is drawn from rods of special composition in our own wire-drawing department. The wires are woven on looms designed and built in the Tyler plant.

Supplied in all widths up to and including 250 inches

The W. S. TYLER COMPANY, *Cleveland, O.*

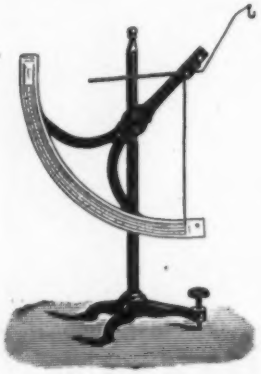


Backing Wire Tyler Fourdrinier Wire Corduroy Cloth

TYLER WIRES

SCHOPPER

World Standard Paper Testers

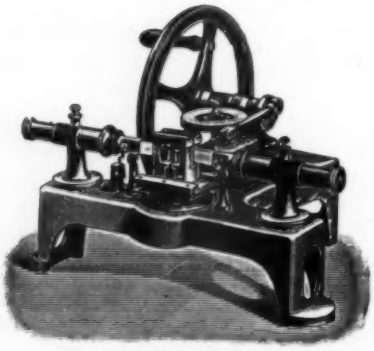


All Kinds of Scales

Patented

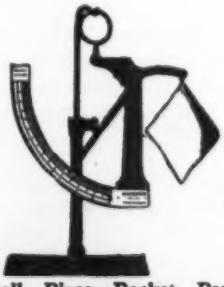
Schopper-Riegler Beating Tester
Uniformity of beating means better paper.

The Schopper Standard Desk Micrometer
Carried in stock—1/1000 of an inch for Boards, 1/2000 of an inch for Paper.

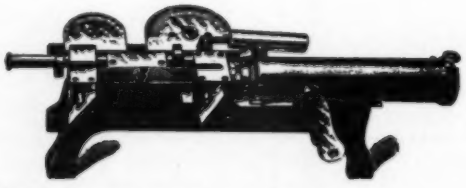


Schopper Folding Tester
The folding test has become standard for bonds, ledgers, and Kraft papers.

Schopper Strength and Stretch Tester



Small Piece Pocket Paper Scale
By weighing a piece 2 in. by 4 in., gives basis weight 25x38, 24x36, 22x34, 500 sheets.



Rapid Strength and Stretch Tester

FOREIGN PAPER MILLS, Inc.

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72 DUANE STREET, NEW YORK

Warehouses: NEW YORK—MONTREAL

Write for Booklet on Paper Testing Instruments No. I-100

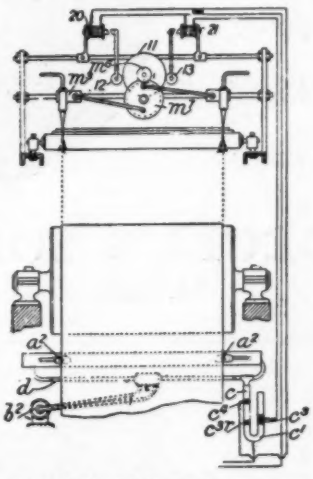
Technical Developments in the Paper Industry

Domestic and Foreign

The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Slitting in Paper Machines

RELAYS are used for adjusting the width apart of the spray nozzles (m^3) used for cutting off the edges of the soft paper mass in the manufacture of paper of the required width. The electric relay is operated by air nozzles (a^3) which are connected with a vacuum pump (b^3) and to a mercury vacuum switch (c) which contains mercury (c^1) and contacts (c^4), and pieces of iron (c^3) and (c^3r) floating on the mercury. The apparatus is adjusted by means of the valves (d) so that no circuit is made when both nozzles (a^3) are partly covered.



The covering or uncovering of either of them alters the suction in the vacuum switch and completes a circuit through one or other of the electromagnets (20) and (21) and one of the driven friction discs (12) and (13) is brought into contact with a disc (11) which carries a worm (m^6) which turns a crank disc (m^7) to move the nozzles (m^3) inwards or outwards. The contact is broken and the adjusting operation stopped when the edges of the web are brought into correct relation with the nozzles (a^3). The apparatus may be used to adjust cutting knives mounted on the paper machine beyond the drying cylinders. British Patent No. 273,602.

Digesting Beech Wood with Nitric Acid

EXPERIMENTS have shown that the nitric acid process is very suitable for the preparation of pulp from beechwood. This wood is characterized by having a short fiber and a relatively high density. The usual method of cutting cross-grained chips gives a product whose penetration is poor and the result is a short fiber pulp. The best results are obtained by slicing the wood longitudinally into slices one to two millimeters thick.

The wood is impregnated with nitric acid of the correct concentration at the ordinary temperature for a period of two to three hours. The acid is then drained off and heated up to the desired digestion temperature in a separate heater. The acid is then pumped back again into the apparatus which is immersed in a water bath whose temperature is maintained at 79 degrees C. Digestion is complete within a period of approximately one hour. The acid is drained off and the chips which retain their shape are washed with water.

Disintegration only takes place during the next process which consists in a treatment with a hot two per cent solution of sodium hydroxide. This dissolves out the incrustating matters and the cellulose is liberated. A modification of the process, which is due to Lifschuetz, consists in treating the wood with a mixture of sulphuric and nitric acids. However the yields, obtained in this process, are poor, and the cellulose is more highly modified, the greater the concentration of the sulphuric acid.

It is noted that in the course of the action of the nitric acid on the wood, the temperature in the digester rises above that in the surrounding bath. This is due to an exothermic reaction which must be controlled if good results are to be obtained. The most favorable results are obtained with the aid of fifteen per cent nitric acid and a water bath temperature of 79 degrees C. The time should not be prolonged beyond ninety minutes to preserve yield and quality. The consumption of nitric acid is 28 to 29 per cent. Pulp of very high quality may be obtained by an after-treatment with nine per cent sodium hydroxide in the cold. Papierfabrikant, 1927, volume 25, Fest und Ausland Nummer, 93-97.

Magnesium Salts in Place of Calcium in Sulphite Cellulose Production

AN INVESTIGATION carried out on this subject in a Russian paper mill gave the following results. In the first place, it was possible to determine that the presence of considerable quantities of magnesium salts protects the pulp during the digestion from injurious, catalytic action; for example, of the comminuted sulphur and sulphur pyrites dust from the gas pipes. It was also found that the sulphite digestion can be carried out at a higher temperature with the magnesium salts than with the calcium salts and the result is an acceleration of the digestion. It was found that these results are obtained not only with the aid of magnesium bisulphite alone, but with this substance in combination with calcium bisulphite as well; hence, this makes it possible to employ dolomite for the production of the sulphite liquor. Bumashnaja Promueschliennost through Zellstoff und Papier, 1927, page 466.

Portable Air Jet for Papermaking Machines

THE illustration shows a portable air jet for use on the papermaking machine. This device consists of a pipe which is closed at one end and which has a longitudinal slot (12) near the closed end. A conduit for compressed air is

connected to the other end of the pipe which also contains the manually-controlled valve (19). A block (21) is placed between the closed end and the valve in the pipe. This block divides the interior of the pipe into two chambers. The block is provided with a longitudinal opening of small diameter. The block serves to cause the air to accumulate within the chamber adjacent to the conduit and thus a constant stream of air of even pressure is delivered to the second chamber and the slot. United States Patent No. 1,644,226.

New Chlorine Process for Pulp Making

THE starting point in the manufacture of long-fibered pulp by the new process is wood, which has been disintegrated with the aid of chlorine. The wood is used in the form of chips. The action of the chlorine gas is effected under pressure. This gives quicker results and better yield of pulp.

The chips are advantageously first softened up before they are subjected to the chlorine treatment, the softening process being accomplished with the aid of a dilute solution of sodium

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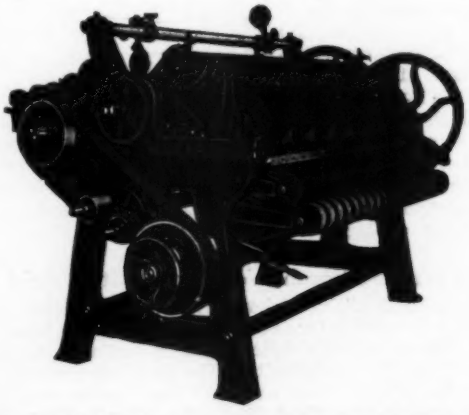

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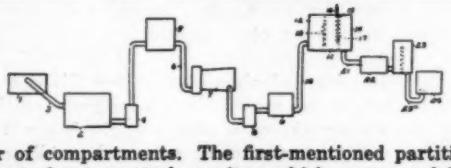
hydroxide. Thereafter the stock is treated at the room temperature with chlorine gas under a pressure of approximately six atmospheres. The operation is carried out in a vessel which is resistant to the action of acids and chlorine gas. The paper stock is then freed from the hydrochloric acid, that is formed during the process, by washing with water, and then without heating the solution, the material is treated with the sodium hydroxide solution which has previously been used for softening the fibers. German Patent No. 446,476.

Papermaking Apparatus

THE papermaking machine which is patented in United States Patent No. 1,644,620 and which is shown in diagrammatic form in the accompanying illustration, has a mixing tank which is divided into a receiving and a discharge end by means of a partition which extends across it. Other partitions then divide the discharge end of the tank into a



number of compartments. The first-mentioned partition has a number of gate control openings which correspond in number to the number of compartments. Each of these openings is in communication with a certain compartment and a number of conduits lead individually from these compartments. A baffle is placed in the tank, in a downwardly extending position, in spaced relation to the first partition and terminating in spaced relation to the bottom of the tank. This baffle is located in the receiving end of the tank and a conduit communicates with the receiving end of the tank at the rise of the baffle remote from the first compartment.

Preparing Sulphite Liquor

THE manufacture of sulphite liquor by conducting cooled, gaseous sulphur dioxide through milk of lime possesses a disadvantage in that the sulphur dioxide is cooled off before introducing it into the milk of lime. Water-irrigated, lead-tube coolers are usually employed for this purpose. The heat in the sulphur dioxide gases, which are at about 500 to 600 degrees C., thus goes to waste and the considerable consumption of cooling water as well as the maintenance of the cooling apparatus increases the cost of manufacture.

If the sulphur dioxide from the sulphur burners is cooled by circulating the fresh liquor through the cooler, then, due to the simultaneous heating of this liquor, a certain portion of the heat is conserved.

The new invention, which is patented in German Patent No. 441,178, is intended to get around this difficulty. The hot sulphur dioxide from the sulphur burners, etc., is brought into direct contact with the liquid for the production of the sulphite liquor. This operation takes place under pressure in closed containers. The sulphur dioxide gas, either alone or in admixture with the other gases and vapors which are evolved along with it from the sulphur burners, is subjected to this treatment.

This process possesses the advantage that the waste heat in the sulphur dioxide gases is completely and most simply carried over into the digestion liquor so that correspondingly less heat is required in the digestion of the pulp. Cold, warm or hot milk of lime serves as the liquid for absorbing the waste heat and forming the digestion liquor. The aforementioned, closed pressure containers may simultaneously serve for the absorption of heat from any source whatsoever; for example, for the absorption of the waste heat from the digesters, whereby the heat in the steam and the gases can be directly or indirectly transmitted into the liquor with or without the use of heat exchangers, which can be arranged within the pressure tanks and on the outside.

Inasmuch as most of the apparatus that is used for the production of sulphur dioxide produces gases which are not absorbed by the liquid, for example, excess oxygen and nitrogen, care must be taken to provide for the removal of this inert mass of gas from the pressure tanks. In order to recover the heat that is contained in these gases or mixtures of gases and vapors, they are mixed with the air used for combustion purposes. In this way the gaseous mixture is heated and then the excess gas is allowed to pass into the atmosphere. The manufactured liquor may be continuously or intermittently removed from the apparatus. German Patent No. 441,178.

Technical Coefficients in Sulphite Making

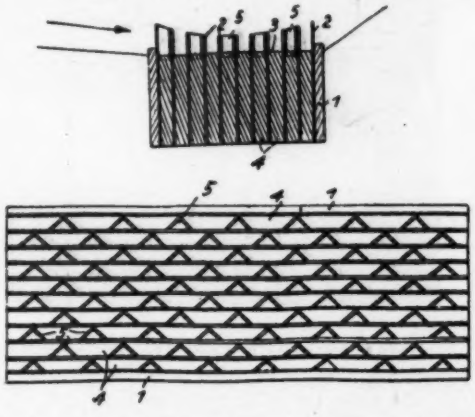
ONE cubic meter of pulpwood in form of pieces of 6.5 to 11 centimeters diameter contains 0.66 solid meters of wood, at 11 to 22 centimeters 0.7 solid meters and at 15.5 to 16.5 centimeters 0.75 solid meters. All mills have to determine the specific weight of the wood that they process. The Sieber number 0.453 is frequently the basis of these calculations. The following figures were found to be the normal wastage with different stocks. Wood from the branches of trees, on screening, one per cent loss; sawdust five per cent loss, of which three per cent can be used in the manufacture of second quality pulp. In the knot catchers, the loss is 2.5 per cent with soft pulp and five per cent with hard pulp. The waste in the centrifugal screens is 0.75 per cent to 1.5 per cent with soft pulp and 2.2 to 2.5 per cent in the case of hard pulp. The loss in the save-alls by utilizing fifty per cent of the back water is 0.5 to 0.7 per cent, and on the screen in the press it is 0.9 per cent. Under these conditions, the normal consumption of pulpwood for one ton of pulp (with thirty per cent moisture content and one cubic meter equal to 0.7 solid meters) is 7.3 cubic meters in the case of soft pulp and 6.9 cubic meters in the case of hard pulp.

The yield of pulp from one cubic meter of the digester content at a moisture content of thirty per cent and a total volumetric content of 250 cubic meters amounted to 74 kilograms for the soft pulp and 78 kilograms for the hard pulp. The calculation of the moisture content and of the volumetric contents of the digester is carried out in accordance with Sieber's method. The sulphur consumption per ton of pulp of soft pulp is 115 kilograms and 105 kilograms for hard pulp.

The steam consumption for digestion without the recovery of the heat in the waste gases and in insulated digesters was 3.2 tons per ton of soft cellulose and 3.0 tons for hard pulp and for drying purposes 2.2 tons, which is reduced by about thirty per cent through the use of high pressure presses. Bumashnaja Promueschlienmostj, through Zellstoff und Papier, 1927, page 466.

Bedplate in Beater

THE invention, that is patented in German Patent No. 443,952, is concerned with a bedplate for a pulp beater over the surface of which bedplate knives project alternately with



other knives. As can be seen from the accompanying illustrations, steel or bronze knives (2) are arranged within the framework (1) of the bedplate, and these knives extend a certain distance over the surface (3) of the bedplate. These knives are arranged in the framework (1), separated by wooden

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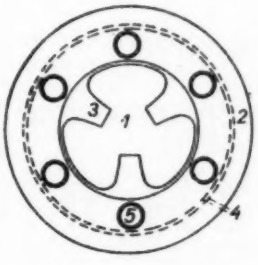
slabs (4). A series of angle irons (5) are arranged between the knives (2). These angle irons form open triangles opposed to the flow of the stock over them, as is indicated by the arrow in the figure. These triangles (5) are arranged in different series with respect to one another. The triangles (5), which are formed of angle iron pieces, are fastened in some suitable manner.

This new arrangement of the bedplate of the beater brings about more effective beating of the stock in that the paper stock is pressed by the knives of the beater roll against the triangular-shaped surface of the bedplate which is opposed to the flow of the stock. And the stock is then forcibly removed from the knives. Thus when a bedplate of the aforedescribed character is employed in the beater, a very much more effective beating action is secured and the time consumed in beating the stock is greatly reduced.

Grinder Stone

IN ORDER to attain a saving in weight and in stone mass in the manufacture of grindstones consisting of artificial stone products, the shape of the stone is contracted in a radial direction in such a manner that the form of the stone in cross-section is very much like that of a very bulky wheel with hub, spokes and rim. The figure shows a stone which has been made in this manner.

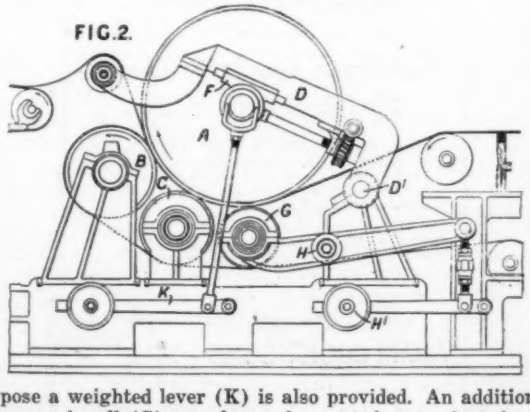


The characteristic large hollow space (1) is recognizable in this stone in which the cross-piece (3) is inserted, extending radially from the ring-shaped piece (2). At (5) are seen a number of pressure pads which take up the pressure of the clamping discs. For further details see German Patent No. 444,554.

Couch Rolls for Paper Machines

COUCH rolls for papermachines comprises an upper couch roll (A), as shown in the accompanying illustration, mounted in arms (D) pivoted at (D^1) and co-operating with two lower couch rolls (B) and (C). The latter are mounted in fixed bearings. The bearings of the upper couch roll is arranged in blocks (F) which are slidable on the arms (D) to adjust the pressure on the rollers (B) and (C) for which

FIG.2.



purpose a weighted lever (K) is also provided. An additional lower couch roll (G) may be used mounted on a pivoted arm (H) and pressed upwards against the roll (A) by means of a weighted lever (H^1). The roll (A) is covered with rubber or like non-absorbent material. British Patent No. 276,103.

Internal Heating of Calender Rolls

GERMAN Patent No. 430,160 is concerned with a process and apparatus for heating the interior of calender rolls, drying cylinders, and the like, with the aid of volatile and, in particular, very volatile fluids, whereby the flames are made to burn within a comparatively narrow cylinder jacket. The purpose of the invention is first to save using the vaporizer or gasifier, which has been required up to the present time. The gasification or vaporization of the fuel is accomplished in this case directly in the heating device itself. On the other hand, the frequent extinguishing of the flame, which occurred in the operation of vaporizing burners, is avoided.

According to the invention, a burner pipe is inserted into the interior of the cylinder jacket and a vaporizing tube, connected with the former and fed with fuel and air, as well as an auxillary tube for secondary air, are arranged in the form of a triangle. These tubes are stationary. The vaporizing tubes are heated to a high temperature by the flames which burn at the outlets of the burner tube, and in this way the fuel, which is led through the vaporizing tubes, is completely vaporized with simultaneous mixing with the likewise heated primary air. Hence, the hot mixture of vapors and air, formed in the vaporizing tubes, where the likewise preheated secondary air enters as well, burns with the evolution of flames of the highest temperature. In order to prevent the extinguishing of the flames due to breaking of the burner tube, the outlet openings of this tube are arranged somewhat tangentially with respect to the burner tube, while the outlet openings of the air tube are so arranged that the emerging current of air does not directly come in contact with the flames.

Winding Paper Webs

IN A web winding apparatus for winding paper as it is delivered from a papermaking machine, the winding shaft is mounted in guides so arranged that the accumulation of material upon the shaft causes it to travel over the surface of the winding drum or other winding means, so as to permit a new winding shaft to be placed in winding position before the removal of the full roll. The ends of the winding shaft, (3), figure 1, are mounted in guides (4), having hinged portions (5) to allow of the insertion of the shaft, and the guides are so shaped that the roll during the winding travels over the surface of the winding drum (1), so that a new winding shaft can be inserted in the guides ready to receive the web. When the roll is full, the web is severed and attached to the new shaft and the old roll is removed to the end of the guides in line with slots (60) through which it may be removed. The winding shaft comprises a sleeve (8), figure 3, loosely mounted on a core (70), which is provided with pinions (10) adapted to engage racks (11), figure 1, on the guides so as to keep the winding shaft parallel to the drum (1). Hooks (12) are also loosely mounted on the core (70) for the attachment of cables (13) carrying weights (15) for counterbalancing the weight of the paper, etc., on the roll. These hooks also serve for the attachment of cables for hoisting the rolls out of the machine. Antifriction rollers (16) may be provided on the core (70) to run in the guides (4). In a modification the lower ends of the guides are so shaped as to hold the winding shaft out of engagement with the drum (1) and in contact with an auxiliary winding drum during the initial portion of the winding operation. British Patent 726,778.

FIG.1

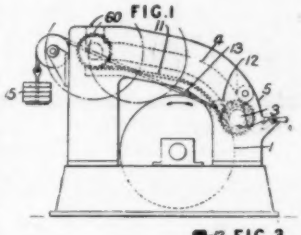
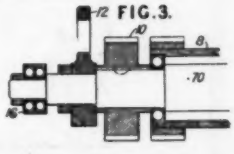
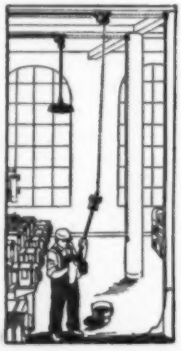


FIG.3.



Cylinder and Fourdrinier Machines

A COMPARISON is made of the advantages and disadvantages of these two types of papermachines in the manufacture of cardboard. The formation of the web on the cylinder machine is closely studied, and compared with what happens on the fourdrinier machine. There is more trouble in governing the formation of the web on the cylinder machine than on the latter. The various improvements that have been carried out in the design and construction of the cylinder wire are discussed. The action of the cylinder is described to be



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mostly influenced by the penetrability of the wire and the diameter of the cylinder. The penetrability is determined by the "free cross-section" of the cylindrical surface and is important in enhancing the passage of water through the wire. The diameter of the cylinder has also a great influence on the dehydrating process, for the degree of hydrostatic pressure depends on it.

The free cross-sectional area is defined to be that surface which allows unhindered passage of the water. This effective area varies quite considerably in accordance with the construction of the cylinder. The newer forms of cylinder machines are made with such forms of cylinders that the extent of the free surface is large, for the importance of this factor in the operation of the machine has become well appreciated.

Another matter that was discussed in this article was the great influence of the various auxiliary devices on the fourdrinier machine on the formation of the paper web on the wire. This refers to the suction box, the deckle strap, head box and the other parts at the wire end of the machine. There are various ways in which improvements can be effected both in the quality and quantity of production in the latter machine, while in the case of the cylinder machine there is just one way in which the effective area of the cylinder wire can be increased and that is by increasing the diameter of the cylinder. The cylinder machine has therefore been found to be unsuitable for the manufacture of certain papers, such as those made from pulp that is difficult to dehydrate.

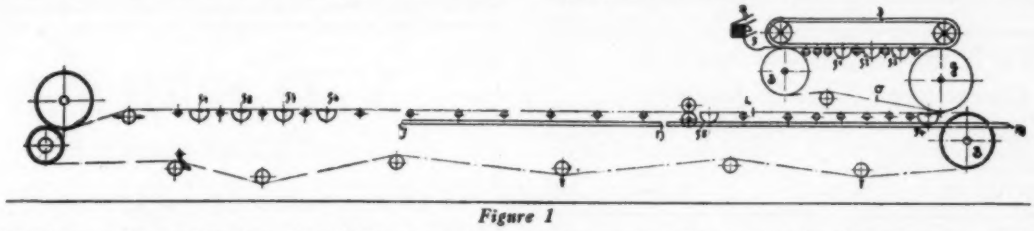

Figure 1

The production on the cylinder machine can be increased only by increasing its width, for the speed at which the cylinder rotates can not be increased over a certain maximum point without running into all sorts of operating difficulties. Furthermore, it is evident that the width of the machine cannot also be unlimitedly increased without introducing serious constructional and operating difficulties.

The illustration shows a machine which has been provided with a top wire in addition to other improvements. The stock runs through the channel (R) into the head box (S) of the top wire (O). This wire runs in the opposite direction to that of the fourdrinier wire, as is always the case when a top wire is provided. The fourdrinier wire is shown at (L). The top wire runs over a breast roll (B) and the couch roll (G), which is made quite differently from the ordinary type of couch roll. The couch roll is made in this case like a cylinder wire. The top wire, moreover, possesses all the characteristics and auxiliary parts of a normal fourdrinier wire, such as suction boxes, and the like.

In figure 2 is shown a papermaking machine with a number of top wires which is used in the manufacture of duplex and triplex cardboard and paperboard. This new arrangement in papermaking machines affords many advantages, not only in permitting the manufacture of the aforementioned products but also in allowing more than one kind of paper stock to be used in making a single web of paper. This may not be new in paper machine operation but the new feature of the aforementioned machine is the use of different top wires. It is thus possible to prepare single paper webs which possess uniform strength both in the length and width. In the manufacture of thick cardboard, the new top wire papermaking machine possesses the advantage in that the lower wire acts as a conveyer on which the individual webs are placed one over the other. The result is that it is possible to make these products at a greater speed than is common on the ordinary type of machine. The production of the machine is increased and the cost of manufacture reduced. Der Papierfabrikant, 1927, pages 650 to 653.

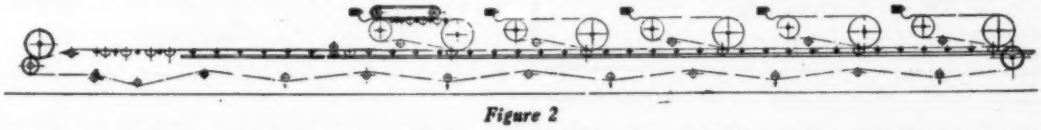

Figure 2

Removing Printers' Ink and the Like from Paper

IT HAS been suggested that a satisfactory process for removing printers' ink in the reworking of old paper consists in comminuting the paper stock and mixing it in a suitable machine, such as a beater, with water and alkali and finely pulverized bentonite. Then the mixture is filtered and washed in order to remove the bentonite from the paper mash.

The new process, which is patented in German Patent No. 444,163, differs from the above in that the treatment of the paper mash with the decolorizing agent and other media is carried out in the presence of dispersive agents or agents that prevent the precipitation of mineral matter, which means that the process is effected in the presence of organic protective colloids. Substances which possess a high degree of adhesiveness are used as protective colloids, as, for example, casein, gelatin in different forms, albumin, gums, for example gum arabic, tragacanth, dextrin and the like, or mixtures of several of these substances with each other or other materials.

The bentonite is added in the dry state and is intimately mixed with the paper mash. The addition of the protective colloid in accordance with the new process enhances the action of the decolorizing agent.

Approximately eighteen kilograms of soapstone are mixed with approximately 170 liters of water and an alkaline solution of 0.36 kilograms of casein, the mixing being carried out in a suitable apparatus. This mixture is then added to approximately one thousand kilograms of old newsprint which has first been converted into the form of a mash with the addition of approximately 19,000 liters of water and approximately four to five kilograms of sodium hydroxide or the equivalent amount of soda or any other alkali, the operation being carried out in a beater. The mixture is kept in constant motion in the beater for a period of approximately thirty minutes and then the paper mash is separated from the liquid by filtration and washing.

Traces of alkali which may be retained by the paper can then be neutralized by means of acids or acid salts. The paper mash obtained in this manner can then be processed in any desirable way, bleached or colored, and worked up finally into newsprint.

Paper Containing Cellulose Hydrate

UNITED STATES Patent No. 1,644,451 is concerned with a process of making paper which contains starch. A portion of the cellulose of the paper is converted into cellulose hydrate. The pulp is beaten and jordaned in order to convert part of it into the hydrated state. The product that is obtained in this manner is then passed through a starch solution which is maintained at a temperature of 120 to 212 degrees F. Then the paper is pressed and dried.

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New York, December 1, 1927.

ACCORDING to reports, and, everything considered, there is activity of moderate scope in the paper industry at present. This is the contracting season, and consumers and distributors in numerous cases are arranging for their supplies well into the new year. There is also a fairly broad demand of current character, while the routine business that is developing day by day is at least measuring up to normal volume. Some in the trade are prone to describe the market situation as rather spotty; others are more critical of the prevailing condition and declare it is decidedly unsatisfactory; yet, when all the opinions that are expressed are weighed, the balance would seem to be that business in paper generally is good and that prospects are favorable.

It is quite true that there are many concerns within the industry—manufacturing as well as merchandising organizations—which are not realizing the rate of net profit in business which the scope of their operations or turnover would most assuredly appear to warrant. This is not the fault of these concerns individually or of the individuals who make up the organizations; it is the fault of circumstances, more than any other cause. Competition in the marketing of paper today, as it has been for some time, is exceedingly keen. Everyone in the industry is striving for orders probably to a greater degree than ever before. The paper mills of the country are equipped to produce a good deal more product than the consuming market can well absorb, and the only alternative to such a situation exists; namely, that there are more sellers than buyers, or, to put it more specifically, there is a larger amount of potential product than the consuming outlet can stand. This, obviously, makes it necessary that manufacturers and dealers work on a narrow margin of profit, with the result that complaint is registered from time to time and in various corners of the trade anent the meagre returns that are being realized; and this in the face of the fact that, from a purely volume standpoint, business in paper doubtless is as good as it ever was in a so-called normal period.

The monthly statistical summary compiled and issued by the American Paper and Pulp Ass'n shows that domestic production of paper and board declined slightly in September as compared with the preceding month. During September mills in the United States produced a total of 567,060 net tons of paper of all kinds, recording a decrease of four per cent as contrasted with the 591,593 tons produced in August, and comparing also with a production of 513,459 tons in July, 560,342 tons in June, 543,592 tons in May, 558,412 tons in April, 596,448 tons in March, 525,896 tons in February, and 515,603 tons in January. The September output was the third largest month's production for the year up to that month, however, and the report shows that during that month mills produced at 85 per cent of normal capacity, tissue paper mills leading in the percentage of output with 100 per cent production and newsprint mills being last in the percentage standing with production at 80 per cent of normal. Shipments from mills in September aggregated 567,420 tons, compared with 582,435 tons in the preceding month, while mill stocks at the end of September amounted to 263,642 tons of all grades, against 269,337 tons a month earlier.

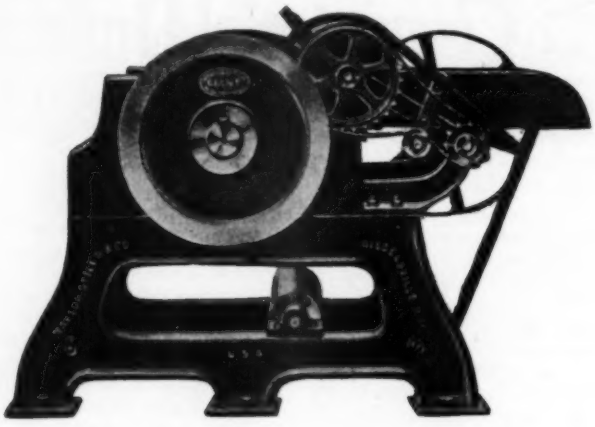
A gain was recorded in production of newsprint in the United States and Canada during October as compared with the preceding month. According to the News Print Service Bureau, production in the United States in that month amounted to 114,675 tons and shipments from mills were 118,371 tons, while Canadian mills produced 191,171 tons and shipped 188,769 tons, making a combined total for the two countries of 305,846 tons produced and 307,140 tons shipped, contrasted with 293,550 tons and 291,520 tons, respectively, in September. During October 17,049 tons of newsprint were made in Newfoundland and 1,075 tons in Mexico, so that the total North American output for the month was 323,970 tons, against 311,568 tons in the preceding month. The Canadian mills produced a total of 1,710,406 tons in the first ten months of 1927, or 161,184 tons more than in the same time of last year, a gain of 10 per cent, while the United States mills produced a total of 1,250,373 tons in the similar period, representing a decline of 151,615 tons or 11 per cent as compared with the corresponding period in 1926. Production in Newfoundland was 16,332 tons or 11 per cent more, and in Mexico 1,241 tons or 12 per cent greater, making a total North American increase of 27,142 tons, or one per cent. During October the Canadian mills operated at 86.5 per cent of their rated capacity and the United States mills at 76.9 per cent. Stocks of newsprint of Canadian mills amounted to 35,774 tons at the end of October and at United States mills 27,939 tons, making a combined total of 63.713 tons, which was equivalent to 4.5 days' average production, and comparing with 64,135 tons at the end of September.

The output of paper board in the United States receded in September as compared with the preceding month, but continued on a fairly high level. A total of 240,175 net tons of board of all kinds was produced by U. S. mills in September, against 259,389 tons in August, mills producing at a rate of 93.9 per cent of rated capacity as contrasted with 89.7 per cent in August, according to the monthly statistical summary of the board industry compiled by the U. S. Department of Commerce in Washington. The September production brought the total for the first nine months of the current year up to 1,848,452 tons, against 1,919,807 tons in the same period of 1926. New orders for board received by mills in September called for a total of 235,960 tons, against 227,397 tons in the preceding month, and unfilled orders held by manufacturers at the end of September were for 120,331 tons of board, contrasted with 112,763 tons a month previously. Shipments of board from mills during September aggregated 228,393 tons, compared with 229,719 tons in August, and stocks of board at mills, at the end of September were 49,161 tons, against 52,283 tons at the end of August.

Demand for book paper is fairly voluminous and has shown some expansion recently. It is reported that most mills are well fixed with orders, particularly those which dispose of the bulk of their production on contract, and quotations are maintained, with the tendency, if anything, in an upward direction. Kraft paper is firm in price and is moving freely. The demand for wrapping for some time has been large enough to keep manufacturers well engaged, and it is stated that they now have a sizable volume of unfilled commitments on hand. Tissue paper is in good demand, and quotably firm.

In fine papers, reports tell of an excellent demand for the cheaper grades, whereas the high qualities are proportionately quiet. It seems to be a further emphasis of the switch in consumption from rag-content papers to sulphite bonds and ledgers. Specialties such as glassines, greaseproof paper and fancy cover papers for paper box work, etc., are moving in good amounts and at firm prices, this being the period of the year when consumption of such papers is at its height.

Demand for plain box boards has slackened to some extent but container boards are in brisk call, and the board industry as a whole is characterized by considerable activity. Prices are maintained quotably without changes of consequence. Building felts and paper are in moderate demand for this season. Manufacturers of roofing felt reduced their prices 15 per cent recently, which, it is reported, stimulated demand decidedly.



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Papermaking Rags

A firm condition exists in the lowest class of papermaking rags or roofing stock, but the remainder of the market is at best quiet, and seemingly altogether in favor of buyers. It might be stated, in fact, that the market in its entirety is a "buyers' market," although there are signs that consumers are finding it necessary to meet at least certain prices to secure sizable supplies of roofing rags. Demand slowed down to an apparent degree during November, and while this quieting of the market is more or less looked for a little later in the year or along in December, the fact that paper manufacturers let up in their purchasing so appreciably so early caused a decided damper to be thrown over the market.

From a general standpoint, business in papermaking rags at present and for some time past has been most unsatisfactory. There simply isn't the volume to demand that formerly was noted. Dealers and importers report having much difficulty obtaining orders for worth-while quantities of rags, and consumers in a great majority of instances exhibit an attitude of non-interest to a degree where a very unpleasant market situation exists. The whole basis of the market condition can be attributed to the acknowledged fact that paper mills in the United States simply are not using rags in the tonnage that they were accustomed to formerly. Competition in selling paper—and the better grades particularly—has obliged many paper mills to turn from rag-content papers to sulphite bonds and ledgers. There is not the consuming outlet for high-grade rag papers that formerly existed, probably owing in large measure to the relatively wide difference in prices of rag papers and those manufactured of wood pulp.

It can be said that the papermaking rag industry is undergoing a drastic alteration. Dealers are not sorting out stock in as numerous grades as they did formerly because they fail to find consuming mills seeking many grades which were at one time wanted. New outlets are being sought for many kinds of rags which formerly went almost entirely to paper mills. The one salvation of the market, from an immediate point of view, appears to be that Europe is consuming rags in extensive volume. Paper mills in Germany, in France and elsewhere on the continent are working on a larger scale at present than at any time probably since before the war, and are using up rags in proportionately big volume. Consequently, there is not the eagerness to sell rags to the United States evinced by European exporters, especially since prices to be secured in domestic markets abroad are much more favorable than those now prevailing in our market, and importations of papermaking rags of practically every class into this country are falling off at a marked rate. This, in a measure, is helping to hold market values here passably steady, although the undertone in prices is easy and there is a decided downward tendency noticeable.

Roofing-paper manufacturers are absorbing rag supplies fairly freely and are granting steady prices within certain well-defined limits. Sales of No. 1 domestic roofing stock or cloth strippings have been reported at 1.85 and 1.90 cents per pound f. o. b. dealers' shipping points, while No. 2 domestic roofing is bringing around 1.45 cents at shipping points. Foreign dark-colored cottons have been sold to roofing mills at 1.60 and 1.65 cents a pound ex dock New York and in some instances up to 1.70 cents has been reported paid. Buyers have been confining their orders for foreign roofing stock to rather small lots, however, and principally for forward shipment from abroad.

New cuttings are in a much quieter market position than they were. Mill demand has simmered off until there is only a very spotty business transpiring, and prices of some grades have eased slightly. Importers assert that it is very difficult for them to market new cuttings in this country because substantially higher prices obtain in Europe than paper mills here are willing to pay. Dealers ask 12 cents or higher per pound f. o. b. shipping points for No. 1 white shirt cuttings, 6 cents for fancy shirt cuttings, 10 cents for unbleached cuttings, 9.50 cents for white lawns, 7 cents for blue overall cuttings, 7.50 cents for light silesias, 9.25 cents for bleached canton flannels, 5 cents for black silesias, and 4.75 cents for washables.

In old white cottons, occasional sales are recorded but at generally unchanged price levels. No. 1 repacked whites are available at 6 to 6.50 cents a pound at shipping points, and probably at less for some qualities of packing, while No. 2 repacked whites are quoted by dealers at around 3 cents. Repacked thirds and blues are selling at 2.25 cents a pound f. o. b. dealers' points, and rough blues at 1.75 cents.

Average quotations f. o. b. shipping points and ex dock New York are as follows:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	11.75-12.00
White shirt cuttings, No. 2	7.00- 8.00
Fancy shirt cuttings	5.75- 6.00
Washables, No. 1	4.50- 4.75
Unbleached muslin	9.75-10.00
White lawns	9.25- 9.50
Overall cuttings, blue	6.75- 7.00
Black silesias	4.75- 5.00
Light flannelettes	8.25- 8.50
Canton flannels, bleached	9.00- 9.25
Canton flannels, unbleached	8.00- 8.25
Shoe cuttings, bleached	8.50- 8.75
Shoe cuttings, unbleached	6.75- 7.00
Light silesias	7.25- 7.50
O. D. khaki cuttings	5.50- 5.75
Mixed khaki cuttings	5.00- 5.25
Corduroy cuttings	3.00- 3.25
Cottonade cuttings	3.25- 3.50
Linens, No. 1 white, foreign	13.00-14.00
Light prints, foreign	2.75- 3.00
Old Stock—	
Whites, No. 1 repacked	6.00- 6.50
Whites, No. 2 repacked	2.75- 3.25
Whites, house soiled	2.00- 2.25
Whites, street soiled	1.85- 2.00
Lace curtains	5.75- 6.00
Thirds and blues, rough	1.60- 1.75
Thirds and blues, repacked	2.10- 2.35
Black Stockings	3.75- 4.00
Cotton canvas, No. 1	4.75- 5.00
White cotton batting	3.25- 3.50
Roofing, No. 1 (cloth strippings)	1.80- 1.90
Roofing No. 2	1.40- 1.50
Linsey, garments, foreign	1.80- 1.90
Dark colored cottons, foreign	1.60- 1.70
Blue linens, foreign	3.75- 4.00
Gray linens, foreign	4.00- 4.25
White linens, foreign	7.50- 8.00
Light prints, extra foreign	1.80- 2.00

Rope and Bagging

One of the important changes in the papermaking materials markets has been a sharp decline in prices of old rope. Due to a continuance of slack demand from paper mills for this commodity, and a resulting piling up of stocks despite the receipt by dealers of less than normal supplies of old rope, prices have dropped severely, and the reduced market values

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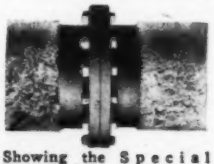

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have failed to stimulate buying to any perceptible degree. Domestic No. 1 old manila rope is reported available at 3.75 cents per pound f. o. b. shipping points, and possibly at less, while so little demand exists for imported rope that it is difficult to determine what the actual market level for such stock really is. It is apparent that mills can buy No. 1 foreign rope at 3.25 cents a pound ex dock New York, and perhaps at under this price.

Old bagging is holding its own in price and is moving in restricted volume into consuming channels. Papermakers show but occasional interest, insofar as buying in an important way is concerned. Available supplies are none too plentiful, however, and this helps to sustain prices. No. 1 scrap bagging is bringing 1.65 cents a pound at shipping points, and roofing bagging 1.25 and 1.30 cents. Gunny is quiet, and there is limited trade activity in strings.

F. o. b. shipping point and ex dock New York quotations follow:

	New York and Chicago
Gunny, No. 1 domestic	1.85-2.00
Gunny, No. 1 foreign	1.80-2.00
Scrap bagging, No. 1	1.60-1.75
Roofing bagging	1.25-1.30
Wool tares, heavy	2.25-2.50
Wool tares, light	2.00-2.25
Manila rope, No. 1 foreign	3.25-3.50
Manila rope, No. 1 domestic	3.75-4.00
Sisal strings	1.75-2.00
Mixed strings	.90-1.15

Old Paper

It is not uncommon for demand for old paper to slow down as the end of the year approaches. Boxboard mills curtail manufacturing operations and therefore are in need of less tonnage of waste paper, and demand from other consuming quarters slackens. However, everything considered, the market at present is moderately active. There is not the keen desire for stock that was noted among consumers a few weeks ago but a sufficient movement is in progress to keep prices fairly steady, and although the price tendency in most grades now is downward, no broad changes have been recorded.

Shavings seem to be in a softer market position than any other classes of stock. Consumers of paper shavings apparently are using more wood pulp than ordinarily and, therefore, have cut down their purchases of the substitute material, and reports state that No. 1 hard white shavings are available in the market at 3 cents a pound at shipping points and perhaps at a little below this level; No. 2 hard white shavings at 2.65 cents, and No. 1 soft white shavings at 2.70 cents. Kraft papers are in relatively good demand and are quoted steadily. No. 1 old kraft is bringing 2.10 cents a pound and higher at dealers' shipping points, and new kraft cuttings 2.65 cents. Books and magazines are steady in price at 1.25 to 1.30 cents per pound at shipping points for No. 1 heavy book, and 1.10 cents for No. 1 crumpled books. Ledger stock is selling on a price range of 1.60 to 1.85 cents a pound, depending on the quality of packing.

Folded newspapers are quoted in the East at 65 to 70 cents per hundred pounds f. o. b. New York, and No. 1 mixed paper at 55 to 60 cents. In the Middle West, however, slightly higher prices than these generally obtain. New corrugated box cuttings are moving readily and at steady prices of around 90 cents a hundred pounds at shipping points.

The following quotations are those named by dealers f. o. b. shipping points:

	New York and Chicago
Hard white shavings, No. 1	2.90-3.25
Hard white shavings, No. 2	2.65-2.85
Soft white shavings	2.65-3.00
Colored shavings	1.25-1.50
Heavy book, No. 1	1.25-1.35
Crumpled book, No. 1	1.05-1.15
Ledger stock	1.60-1.85
Kraft, No. 1	2.00-2.25
New kraft cuttings	2.60-2.80

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New corrugated box cuttings	.85- .95
Mixed paper, No. 1	.55- .65
Common paper	.40- .50

Pulpwood

Very little open market activity of consequence is reported in pulpwood. Most consumers seem well supplied and are not engaging in buying, other than on a small scale or in arranging contracts for next year. Reports from Canada say that, owing to large carryover stocks at consuming centers in that country, cutting of wood in the Dominion this year will be rather heavily curtailed. This might possibly lead to a much firmer market position of pulpwood, though such an eventuality is of course a distance ahead.

Mechanical Pulp

It is very evident that a better condition obtains in the market for ground wood. There is more buying interest manifested by consumers in various quarters, business has increased to some extent, and a decidedly steadier price tone is noted. This improvement is being brought about by two major factors, one of which is that consumption is on the rise, thus reducing to some extent the stocks of pulp held by consumers and grinders, and the other is that production continues on a much less than normal scale. It is a fact, according to authoritative information, that certain large grinders in Canada are not turning a wheel of their plants in the production of ground wood. Production in the Scandinavian countries has been curtailed greatly also, and the smaller output in the various manufacturing countries is helping to make for a firmer statistical condition. Grinders take the view that it is foolhardy for them to produce ground wood while unable to secure prices in the market which show them a profit in manufacturing operations, and it is likely that many of them will refuse to grind until market values have appreciated to levels where they can produce and market pulp profitably.

Prices as quoted have stiffened a little. Most grinders in Canada ask $25.00 a ton or thereabouts f. o. b. pulp mills for prime spruce ground wood, and domestic ground wood is quoted around $26.00 at grinding plants. Sales are being made under these figures, however, in some cases. Imported ground wood of Scandinavian origin is selling at $28.00 to $30.00 per short ton ex dock New York or other American Atlantic ports for dry pulp.

Production of ground wood in the United States during September, 1927, amounted to 63,486 net tons, compared with 67,136 tons in the preceding month. Mill stocks at the end of September were 102,528 tons, against 120,606 tons a month previously.

Chemical Pulp

The market for domestic wood pulp is not exhibiting a great deal of activity, according to reports, but there appears to be a fair movement in the aggregate, although chiefly against contracts and back orders. Consumers are buying readily enough when in need of supplies but seem to be confining their market operations almost solely to pulp actually and directly required. Quotations are holding but reports come through from time to time of transactions at shaded rates, which would imply that manufacturers are accepting some orders at concessions.

Bleached sulphite of prime grade is quoted at 4 cents a pound f. o. b. pulp mills, and the extra qualities at 4.50 and 4.75 cents. However, some sales at 3.75 cents and down to 3.67½ cents have been reported. Strong sulphite of news grade is around 2.50 cents a pound in price f. o. b. pulp mills, and of book grade around 2.85 cents. No. 1 domestic kraft pulp is quoted 2.75 to 3 cents per pound f. o. b. producing plants.

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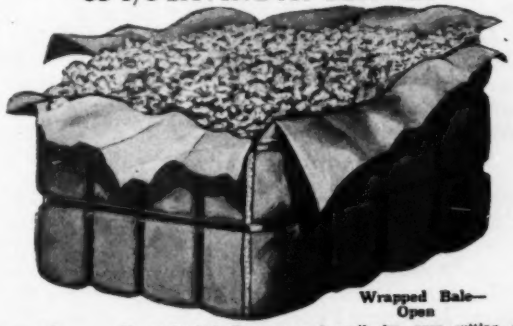
THE PULP BUYER WILL TELL WHY
Fidalgo System Dried and Shredded Pulp
(Air Dried)
IS THE ANSWER
Units 10 to 75 ton daily capacity.
Producing a compact air dry bale (suitable rail and water shipment 40-45 cu. ft. per ton) of shredded pulp.
33 1/3 SAVING AT BEATER



Wrapped Bale—Open

General Advantages No mechanical Pressure used until dry—upon cutting straps at Beater entire bale allowed to absorb rapidly. No surface on wet pulp during drying process. Only current of warm dehydrated air, produces a product that has its surface pores wide open for ready absorption in Beater and produces a pulp testing from 10 to 30 points higher than any pulp dried in sheet form.

Labor, Steam, Power, Etc. LESS LABOR than any cylinder or mechanical pressure dryer. Less than 3,500 lbs. steam required (either live or exhaust) per ton air dried pulp, with economizer pulp can be dried with waste stack gases.

Cleanliness Pulp being dried in closed insulated compartment—FIDALGO SYSTEM produces cleaner pulp.

Users Eight installations in United States and ten on order or under construction. Your inspection invited.

Cost Less than any Drying Method we know of to install.

Write Us for Particulars

Technical Economist Corporation
40 RECTOR STREET, NEW YORK, N. Y.
Telephone Whitehall 5243 *Cable Herenco*

Uncle Jake says—

"Some Mighty Poor Trotting Horses Have Made a Record When Their Gait Was Changed to Pacing"

Quite frequently we run across a Printer who tells us that by switching to

KVP BOND

he has materially increased his business.

Our Research Department has unearthed some things that may help you. Ask us and they will come to you without charge.

KALAMAZOO VEGETABLE PARCHMENT CO. KALAMAZOO, MICH.

WE WILL BUY

American Writing Paper Co. 6½s, 1939	@	80
Bedford Pulp & Paper 6½s, 1942	@	98
British Columbia Pulp & Paper Co. 6s	@	85
Continental Paper & Bag 6½s, 1944	@	86½
Donnacona Paper Co. Preferred	@	103
Hoberg Paper & Fibre Co. 7s, 1937	@	94
Long Bell Lumber Co. 6s, 1931	@	90
Niagara Alkali Co. & Electro Bleaching Gas Co. 7s	@	100
Pacific States Lumber Co. 8s	@	OW
St. Regis Paper Co. Pfd.	@	104
United Paperboard Co. Pfd.	@	63
Watab Paper Co. 6½s, 1942	@	102¾

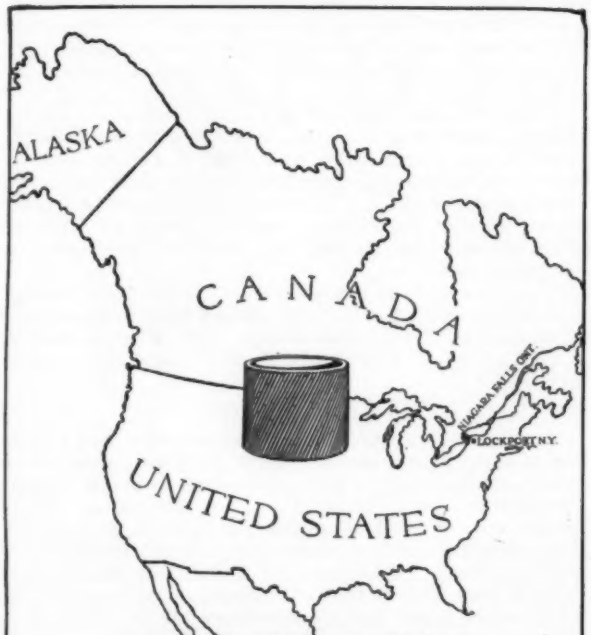
WE WILL SELL

Braun Lumber Co. 5½s, 1937	@	100½
Cady Lumber Co. 6½s, 1939	@	93
Dierks Lumber & Coal 6s, 1946	@	101½
Donnacona Paper Co. Common	@	95
Filer Fiber Co. 7s	@	94
Great Northern Paper Co.	@	71
Great Southern Lumber Co.	@	123
Kirby Lumber Co. 6s, 1938	@	99
Marinette & Menominee Paper Co. 7½s	@	104½
New England Lime Co. Pfd.	@	98
St. Anne Paper Co. 6½s, 1946	@	102½

H. D. KNOX & CO.

44 Broad St., N. Y. 27 State St., Boston

Inquiries invited on all Paper Pulp Lumber Securities



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LOCKPORT N.Y. U.S.A.

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OF CANADA LTD.
NIAGARA FALLS ONT.

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PAPER & PULP MILL SPECIALTIES

New Papers

Writing—	
White rag	15-40
White sulphite	9-30
Colored rag	15-40
Colored sulphite	8-30
Ledger—	
White rag	16-40
White sulphite	9-30
Colored sulphite	8-30
Colored rag	15-40
Bonds—	
White rag	16-40
White sulphite	7-30
Colored sulphite	7-30
Colored rag	15-40
Book—	
No. 1 S. & S. C.	6.35- 8.00
Machine finished	6.25- 8.00
English finished	6.25- 8.00
Coated and enameled	8.00-14.00
Lithograph, M. F.	8.00-15.00
Newsprint—	
Rolls, contract	3.25- ....
Rolls, transient	3.50- ....
Sheets	3.65- 3.80
Side runs	3.00- 3.25
Cover Stock—	
Coated, both sides	10.25
Coated, one side	10.15
Tissue—	
No. 1 white, 20x30	.75- .85
No. 2 white, 24x36	.70- .80
No. 1 manila, 24x36	.70- .80
Kraft	.90- 1.00
Wrapping—	
No. 1 kraft	6.00- 6.50
No. 2 kraft	5.25- 5.50
Southern kraft	4.50- 4.75
Boards—	**New York and Chicago**
Solid news	52.50-57.50
Straw	52.50-57.50
Plain chip	45.00-50.00
White coated chip	52.50-57.50
Manila coated chip	55.00-60.00
Binder's board	70.00-75.00

Chemical Pulp

(*Continued from page* 1595)

Mills in the United States produced a total of 105,019 net tons of chemical pulp in September last, as compared with 110,069 tons in August, according to the American Paper and Pulp Ass'n. Stocks at producing mills at the end of September aggregated 19,255 tons, against 20,127 tons a month earlier.

Quotations f. o. b. pulp mills are as follows:

Bleached sulphite	4.00-4.75
Easy bleaching sulphite	2.80-3.00
Unbleached sulphite, No. 1 strong (news grade)	2.40-2.70
Unbleached sulphite, No. 1 book	2.70-3.00
Soda pulp, bleached	3.25-3.50
Mitscherlich, unbleached	3.00-3.25
Kraft, No. 1	2.75-3.00
Screenings, refined	1.40-1.60

Chemicals

Paper manufacturers are contracting freely for the various chemicals which they use, and open market activity is fair. The price tone generally rules steady and such revisions as have been made in quotations are of slight dimensions. Bleaching powder is steady quotably at 2 to 2.40 cents per pound f. o. b. works, depending on quantity. Soda ash is selling in bags at 1.32½ cents a pound at works, and caustic soda at 3 to 3.10 cents. Demand for casein is reported rather slow but quotations are maintained at 17 to 18.50 cents a pound, duty paid on the imported product.

Average quotations are as follows:

Alum, lump ammonia	3.50 - 3.75
Alum, lump starch	3.75 - 4.00
Blanc fixe, powder	4.00 - 4.25
Bleaching powder	2.00 - 2.40
Brimstone (long ton, at mine)	18.00 -19.00
Casein (duty paid)	17.00 -18.50
Caustic soda, spot delivery	3.00 - 3.10
China clay, domestic washed	8.00 -10.00
China clay, foreign	14.00 -20.00
Rosin, Grade E	8.40 - 8.50
Satin white	2.00 - 2.25
Soda ash, 50 per cent light (bags)	1.32½-.....
Starch, papermakers', in bags	3.07 -.....
Talc (ton)	16.00 -18.00

Market Quotations

Issued by H. D. Knox & Co., 44 Broad St., New York

The quotations mentioned below are more or less nominal in some cases owing to the inactivity of the securities, but we invite inquiries on these and other allied industries' securities when we will endeavor to furnish actual markets.

BONDS	BID	ASKED
Abitibi Fibre Co. 6s, 1947	98¾	
Abitibi Power & Paper 6s, 1931	100½	
Abitibi Power & Paper 6s, 1940	104¾	
Advance Bag & Paper 7s, 1943	104½	105¼
American Sales Book Co. 6s, 1939	102½	
American Writing Paper 6s, 1947	94	
American Writing Paper 6s, 1939	82	
American Book 6s, 1928	100	101
Atlas Plywood 6½s		99½
Bastrop Pulp & Paper Co. 6½s, 1940	101¼	
Belgo Canadian Paper 6s, 1943	102¼	103
British Columbia Pulp & Paper 6s, 1950	86½	
Brompton Pulp & Paper 6s, 1935	Mkt.	
Brompton Pulp & Paper 6s, 1946	100¾	101¾
Brown Co. 5½s, 1946	100⅝	
Brown Paper Mills 6s, 1935-41		100
Bedford Pulp & Paper 6½s, 1942	98	100
Beaver Products 7½s	109	
Canadian Paper Co. 6s, 1938	99½	
Canadian Paperboard 7s, 1937	98½	100½
Cape Breton Pulp & Paper 6s, 1932	101	103
Celotex Co. 6½s, 1939	100½	102
Central Paper 6½s, 1941	87	
Central Paper 6½s, 1942	87	
Central Paper 6½s, 1930	88	
Central Paper 7s, 1932-33	88	
Celotex Co. 6s, 1929	100	103
Celotex Co. 6s, 1936	97½	
Champion Fibre Co. 6s, 1941	100½	101
Champion Paper 6s, 1935	95	
Champion Coated Paper 6s	100	
Container Corp. of America 6s, 1936	99¼	
Continental Paper Products 6½s, 1942	89	92
Continental Paper & Bag 6½s, 1944	87¾	
Crown Willamette Paper 6s	101¾	102½
Dells Paper & Pulp 6s	95	
Donnacona Paper 6s, 1940	101	
Eastern Mfg. Co. 7s, 1942	90	92

(Continued on page 1605)

The B Co. Inc. QUALITY PULPS

"HAFSLUND BEAR"
Bleached Sulphite

"FORSHAGA"
Bleached Sulphite

"HURUM SPECIAL"
Extra Strong Kraft

"BAMBLE"
Extra Strong Kraft

Fresh Monthly Shipments—No Closed Winter Season

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Incorporated
200 FIFTH AVENUE NEW YORK, N. Y.

BATHURST LUMBER COMPANY, LIMITED

PRICE & PIERCE, LTD.
17 East 42nd Street, NEW YORK CITY

ARE NOW THE

SELLING AGENTS
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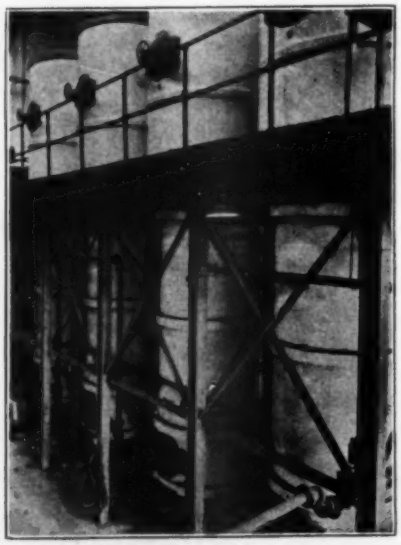
Unbleached Sulphite 50 tons daily
Kraft Pulp 50 tons daily

Our pulp is made from Canadian Spruce
We ship in sheets, baled

BATHURST, NEW BRUNSWICK, CANADA

IMPROVED BADGER BLACK LIQUOR EVAPORATORS

Recent Installation
NORTHWEST
PAPER CO.
Cloquet, Minn.



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MAXIMUM
STEAM ECONOMY

NO ENTRAINMENT

SODA and
SULPHATE
PROCESSES

E. B. BADGER & SONS CO., Boston, U. S. A.

See page 314 in the 1926 Paper and Pulp Mill Catalogue

EXPORTS

There was a decline in exports of paper from the United States in September, the value of export shipments in that month being smaller than in the preceding month and also below the value of exportations in the corresponding month last year, according to official statistics issued by the U. S. Department of Commerce in Washington. Total exports of paper of all kinds in September this year reached a value of $1,942,729, compared with exports of a value of $2,076,879 in August last, and $2,249,422 in September, 1926. During the first nine months of the current year exports of paper from the United States were valued at $20,088,807, recording a little gain over the shipments aggregating in value $20,180,017 in the same period of last year.

Exports of newsprint in September dropped off materially, amounting to 1,407,854 pounds of a value of $68,190, compared with 2,430,928 pounds of a value of $116,872 in the preceding month, and 2,825,742 pounds of a value of $128,611 in September a year ago. The largest shipments in September were to South America, 542,706 pounds; to Cuba, 307,492 pounds, and to the Philippine Islands, 177,416 pounds. Exports of book paper, not coated, in September amounted to 1,443,216 pounds, valued at $120,959, contrasted with 977,156 pounds of a value of $97,130 in August last, and 1,589,341 pounds of a value of $141,075 in September, 1926.

Wrapping paper exports from the United States in September were 1,928,878 pounds, valued at $143,686, against 2,507,175 pounds of a value of $183,322 exported in the same month last year. Shipments of writing paper recorded an increase, amounting to 1,118,170 pounds of a value of $136,855 in September this year, compared with 977,675 pounds of a value of $128,974 in September, 1926. Boxboard exports declined in September to a total of 3,509,449 pounds of a value of $102,610, against 4,762,380 pounds of a value of $142,588 in the similar month of 1926, while exports of other paper board and strawboard in September were 2,457,397 pounds, valued at $142,088, against 3,856,432 pounds of a value of $171,285 in September a year ago. Exports of toilet paper were 479,974 pounds of a value of $53,717 in September, contrasted with 486,221 pounds of a value of $59,861 in the same month last year.

IMPORTS

Wood Pulp

There are signs aplenty that the imported wood pulp market is developing a steadier undertone. Cable advices report that the Baltic already is partially closed to navigation and that shipments of pulp from some ports on the east coast of Sweden have ceased for the winter. Northern Europe is experiencing a very early winter, and this constitutes a factor which in due time may result in a much stronger technical market position for pulp, as it is likely considerable pulp which American paper manufacturers have been counting on receiving prior to the close-up of the Baltic Sea cannot be shipped until next spring. New York importers say that in quite a few instances mills in Sweden have advised them they are no longer able to effect shipments since navigation is closed, and when it is understood that seldom does the freeze-up occur before the middle of December, and frequently not until after the turn of the year, it can be appreciated that the probabilities are, a good deal of pulp will be shut off to United States consumers.

This development has created a better sentiment within pulp trade circles and there is unmistakably a steadier price tone to be noted. Sellers are not as prone to shade prices to effect sales as they were, and it would certainly appear as though bottom market levels have been witnessed. It is possible that market prices may stiffen. Meantime, consumers are proceeding carefully in purchasing pulp. There is business transpiring right along but it is largely of routine character and fails to have material influence on market values. Certain mill brands of sulphite and kraft rule quite steady quotably, yet there are indications that in other cases sellers are anxious to secure orders and are marketing less desirable grades of pulp at slight price concessions at least.

Imports of wood pulp into the United States kept up to a high level in September, according to official statistics issued by the U. S. Department of Commerce in Washington. During September a total of 107,244 long tons of chemical wood pulp of all grades was imported into this country, which constituted the largest amount imported in any previous month of this year with the single exception of last January when imports reached 137,607 tons. The September imports compared with 106,548 tons imported in the preceding month and brought the total for the first nine months of 1927 up to 899,792 tons, or a monthly average of 99,976 tons, contrasted with an average of 103,118 tons monthly in the corresponding period a year ago. Ground wood imports in September were 25,347 long tons, against 16,064 tons in August, making a total of 152,790 tons for the nine-month period, or a monthly average of 16,976 tons against 21,388 tons last year.

Bleached sulphite of prime quality is reported selling at 3.55 and 3.60 cents per pound ex dock New York and other American Atlantic ports. Some grades of bleached are available at a little under this price level, down to 3.40 cents being mentioned, but buyers are said to be meeting the higher figures fairly readily on desirable mill brands. Strong unbleached sulphite of prime quality is quoted at 2.50 cents ex dock in most instances, with several dollars per ton more asked for some brands, while No. 2 unbleached is selling at 2.35 cents. Standard prime Swedish kraft pulp is quoted at 2.70 cents ex dock, this being the mill association basis in Sweden, and ordinary unbleached Mitscherlich sulphite is available at 2.40 cents on the dock. Prime Scandinavian ground wood is quoted at $28 to $30 per short ton ex dock Atlantic seaboard.

Current market quotations ex dock New York and receipts at the port of New York during November follow:

Bleached sulphite, No. 1	3.40- 4.00
Unbleached sulphite, strong No. 1	2.45- 2.75
Unbleached sulphite, No. 2	2.35- 2.50
Easy bleaching sulphite	2.80- 3.00
Mitscherlich unbleached, genuine	2.90- 3.15
Mitscherlich unbleached, ordinary	2.40- 2.60
Kraft, standard Swedish	2.65- 2.90
Ground wood, per ton (dry)	28.00-30.00

Castle & Overton, 2,532 bls. from Bremen, 581 Rotterdam and 402 Sundsvall; J. Anderson & Co., 150 bls. from Skien, 2,130 Oslo, 5,100 Hernosand, 7,500 Gefle, 142 Trieste and 500 Stugsund; Atterbury Bros., 3,000 bls. from Oslo and 500 Gothenburg; Perkins-Goodwin Co., 1,125 bls. from Oslo, 450 Sundsvall and 254 Copenhagen; Philadelphia Girard National Bank, 1,050 bls. from Oslo and 125 Iggesund; First National Bank of Boston, 2000 bls. from Oslo; Pagel, Horton & Co., 3,500 bls. from Gefle; Price & Pierce, 1,201 bls. from Wallvik, 1,850 Gothenburg and 450 Stugsund; E. M. Sergeant Co., 1,197 bls. from Gothenburg; Parsons & Whittemore, 120 bls. from Gothenburg; Bulkley, Dunton & Co., 250 bls. from Hamburg, 2,025 Sundsvall, 1,950 Hernosand, 625 Iggesund and 3,150 Stugsund; Chemical National Bank, 128 bls. from Hamburg, 1,500 Iggesund and 980 Oslo; American Exchange Irving Trust Co., 337 bls. from Hamburg and 3,600 Hernosand; Lagerloef Trading Co., 340 bls. from Hamburg and 1,224 Bremen; Scandinavian Pulp

J. ANDERSEN & CO.

21 East 40th Street New York City

Importers of Chemical Pulps

BLEACHED AND UNBLEACHED

Agents for Kellner Partington Paper Pulp Co., Ltd.
Sarpsborg, Norway; Forshaga, and Edsvalla, Sweden

The Pulp and Paper Trading Co.

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Dealers in
Domestic Chemical and Mechanical Pulps and Paper

AGENTS FOR
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E. B. EDDY COMPANY, LTD., Hull, Canada
CANADIAN KRAFT LIMITED, Three Rivers, Canada
Dealers in Waysagamack Kraft Pulp

Howard Smith Paper Mills, Montreal, Quebec
EASTERN AGENTS of Sulphite Pulp
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In 38 years of design and manufacture of water filters and softeners, Hungerford & Terry have installed an aggregate daily capacity of more than one billion gallons.

This experience has enabled them to aid paper and other manufacturers to improve their products and reduce their costs of production by the proper treatment of that important material—water.

Is your water supply properly protected to insure highly efficient mill operation and the highest quality in your product? Hungerford & Terry Engineers will investigate your conditions and report to you fully without obligation.

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INC.
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CANTON, MASS.

Woolen Manufacturers Since 1856

REPRESENTATIVES

L. H. BREYFOGLE, Kalamazoo, Mich. INTERNATIONAL TRADING CO., Philadelphia, Pa.

Agency, 2,650 bls. from Sundsvall and 341 Gothenburg; Johaneson, Wales & Sparre, 1,225 bls. from Sundsvall, 5,100 Hernosand and 500 Gothenburg; M. Gottesman & Co., 3,800 bls. from Sundsvall and 2,400 Sebenico; Empire Trust Co., 600 bls. from Oslo; Daniel M. Hicks, Inc., 250 bls. from Hamburg; Central National Bank, 1,000 bls. from Iggesund; E. J. Keller Co., 1,125 bls. from Rotterdam, 997 Bremen and 144 Hamburg; Order, 3,800 bls. from Hernosand, 4,019 Hamburg, 785 Bremen, 5,701 Kotka, 3,600 Oslo and 4,670 Wiborg.

Paper Stock

Importations of papermaking rags into the United States continued on a rather small scale during November, judging from arrivals through the port of New York last month. There were fairly large receipts of miscellaneous paper stock, a good portion of which doubtless was rags, but even counting these arrivals, imports were comparatively light, apparently reflecting the quiet market condition in rags recently. Imports of old rope were somewhat larger than in the month before, and some fair-sized shipments of old bagging were received.

Papermaking rag imports into this country show a sharp decline this year as contrasted with 1926, official Government statistics putting total imports during the first nine months of this year at 279,311,946 pounds, valued at $5,700,851, compared with 361,833,887 pounds of a value of $7,996,091 in the corresponding period a year ago. Imports of waste bagging and waste paper in the same time amounted to 75,494,811 pounds, against 88,972,308 pounds in the similar period last year, while imports of old rope and miscellaneous paper stock were 48,181,378 pounds, compared with 64,217,535 pounds in the first nine months of 1926.

Imports of all kinds of paper stock other than wood pulp at New York in November, 1927, these data being taken from manifests of steamers reaching that port during the month, follow:

Old Rope—E. J. Keller Co., 708 bls.; Brown Bros. & Co., 523 coils and 291 bls.; Chase National Bank, 169 bls.; W. Schall & Co., 36 coils; American Express Co., 439 coils; Ellerman's Wilson Line, 109 coils; Daniel I. Murphy, Inc., 54 coils and 3 bls.; N. E. Berzen, 272 bls.; Equitable Trust Co., 63 coils; United Fibre Co., 56 rolls; International Purchasing Co., 133 coils; J. Chalfin & Co., 130 bls.; Panama Rail Road Co., 66 bls.; Order, 93 bls. and 4 coils.

Old Bagging—Bank of the Manhattan Co., 139 bls.; E. Butterworth & Co., 32 bls.; Castle & Overton, 163 bls.; Darmstadt, Scott & Courtney, 272 bls.; Harmon G. Lichtenstein, 40 bls.; P. Cohale, 126 bls.; British Bank of South America, 71 bls.; Bulkley, Dunton & Co., 102 bls.; William Steck & Co., 35 bls.; Chase National Bank, 38 bls.; E. J. Keller Co., 412 bls.; Order, 95 bls.

Rags—Darmstadt, Scott & Courtney, 108 bls.; Salomon Bros. & Co., 249 bls.; Harmon G. Lichtenstein, 215 bls.; Jaffe Products Co., 25 bls.; Castle & Overton, 893 bls.; Victor Galaup, Inc., 768 bls.; Andrews & Co., 7 bls.; Amtorg Trading Co., 39 bls.; E. Mayer, 25 bls.; Wilkinson Bros. & Co., 5 bls.; S. Birkenstein & Sons, 143 bls.; J. Cohen & Son Co., 39 bls.; American Rag Trading Co., 21 bls.; J. Chalfin & Co., 263 bls.; E. A. Stone Co., 403 bls.; Paul Berlowitz, 198 bls.; E. Butterworth & Co., 113 bls.; Robert Bishop Mfg. Co., 90 bls.; George Carrizzo, 141 bls.; E. J. Keller Co., 1,076 bls.; Bank of New York & Trust Co., 450 bls.; Banca Commercial Italian Trust Co., 866 bls.; Equitable Trust Co., 900 bls.; Chase National Bank, 154 bls.; Bank of the Manhattan Co., 109 bls.; Philadelphia Girard National Bank, 742 bls.; Corn Exchange Bank, 16 bls.; Van Oppen & Co., 40 bls.; W. T. Grant & Co., 20 bls.; International Mercantile Marine Co., 7 bls.; Goldman, Sachs & Co., 574 bls.; American Overoean Corp., 25 bls.; A. W. Fenton, Inc., 381 bls.; W. Schall & Co., 26 bls.; Brown Bros. & Co., 148 bls.; C. R. Spence & Co., 693 bls.; J. B. Moors & Co., 12 bls.; Order, 2,591 bls.

Miscellaneous Paper Stock—Castle & Overton, 665 bls.; J. Cohen & Son Co., 50 bls.; B. D. Kaplan & Co., 64 bls.; Chase National Bank, 1,733 bls.; Union National Bank of Philadelphia, 561 bls.; Equitable Trust Co., 280 bls.; Salomon Bros. & Co., 231 bls.; Robert Bishop Mfg. Co., 162 bls.; S. Birkenstein & Sons, 597 bls.; E. Butterworth & Co., 354 bls.; Daniel M. Hicks, Inc., 162 bls.; Darmstadt, Scott & Courtney, 188 bls.; Alexander H. Searle, Inc., 293 bls.; Milton Snedeker Corp., 154 bls.; State Bank, 224 bls.; New York Trust Co., 180 bls.; Harmon G. Lichtenstein, 15 bls.; American Rag Trading Co., 36 bls.; American Express Co., 68 bls.; National City Bank, 35 bls.; E. Vermesse, 191 bls.; Bank of the Manhattan Co., 54 bls.; Brown Bros. & Co., 46 bls.; National Bank of Commerce, 258 bls.; Bank of New York & Trust Co., 452 bls.; American Exchange Irving Trust Co., 58 bls.; Central National Bank, 16 bls.; Royal Mfg. Co., 117 bls.; C. B. Richard & Co., 385 bls.; T. D. Downing & Co., 185 bls.; P. Cohale, 155 bls.; French-American Banking Corp., 124 bls.; Bulkley, Dunton & Co., 71 bls.; W. Schall & Co., 69 bls.; Green, Hamilton & Co., 29 bls.; E. J. Keller Co., 594 bls.; Order, 2,025 bls.

Paper

Imports of finished paper into the United States showed a slight decline in value in September last as compared with the preceding month, but scored a sharp gain over the importations in the corresponding month of 1926, according to official statistics issued by the U. S. Department of Commerce in Washington. During September this year paper imports were valued at a total of $12,566,617, against $12,578,414 in August last, and $10,531,591 in September a year ago. During the first nine months of the current year importations reached

MITTS & MERRILL

Conveyor or Gravity Feed Shredder

THE operation of a beater, with its wear and tear and tremendous power consumption, has one primary purpose, namely, hydration. Anything that will economically bring about hydration more quickly relieves the beater just that much, cuts down on operating costs and speeds the process of paper making.

The Mitts & Merrill Shredder performs on magazines, books, old paper and boxboard, frozen or dried pulp laps, roll and sheet stock, in such a way as to greatly reduce their resistance to hydration when they reach the beater. It gives the beater an economical lift.

Our Shredders are built in sizes with spouts ranging from 18" to 45" wide. We will be glad to quote you on any size adapted to your requirements.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse.

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You HAVE A Beating Problem!

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The MID-WEST HI-SPEED beater will solve your problems in a way never before possible. It gives you EVERYTHING you ever hoped to get in a beater.

We HAVE The Answer!

WHY NOT INVESTIGATE?

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A Fitchburg Felt

¶ For whatever paper you make, whether fine ledger or bond, book or coarse paper, Fitchburg Felts give long and efficient service.

¶ Fitchburg Cotton Dryer Felts are made in two, three, four, five and six ply in English weave, from 60 to 210 inches in width.

¶ *When next thinking of dryer felts, think of "Fitchburg."*

FITCHBURG DUCK MILLS

ESTABLISHED 1844

54 Duck Mill Road FITCHBURG, MASS.

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"Excelsior" Felts

For EVERY GRADE of PULP & PAPER

We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made *the first endless paper machine felts manufactured in America.*

Seamless felts for fast running.
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Special felts to meet every condition.
Send us your felt problems.

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■

Sold by
BULKLEY, DUNTON & COMPANY
75-77 Duane Street, N. Y.
and direct

a value of $108,815,069, showing an appreciable increase over the imports valued at $101,266,273 in the same period of 1926.

Paper imports were fairly large in November, judging from receipts through the port of New York last month. There were some sizable amounts of printing paper and wrapping received, and usual supplies of cigarette, filter, hanging and other grades. Imports of paper of all kinds at the port of New York in November, 1927, these data being taken from manifests of steamers arriving at that port during the month, follow:

Printing—Journal of Commerce, 3 bls. from Bremen; A. S. Zabriskie, 306 bls. from Bremen; C. B. Richard & Co., 80 bls. from Hamburg; P. C. Zuhlke, 168 cs. from Antwerp; Perkins-Goodwin Co., 110 reels from Hamburg and 526 rolls Bremen; F. Henjes, Jr., Inc., 62 reels from Hamburg and 5 cs. Rotterdam; New Haven Times-Union, 110 reels from Gothenburg; Perry, Ryer & Co., 93 cs. from Glasgow; E. Dietzgen & Co., 34 cs. from Rotterdam and 68 cs. Hamburg; Box Board and Lining Co., 110 bls. from Bremen; B. F. Drakenfeld & Co., 99 pkgs. from Liverpool; Hudson Trading Co., 140 rolls from Sundsvall, 3 reels Oslo and 223 reels Gothenburg; Oxford University Press, 47 cs. from Liverpool; Bank of Montreal, 3,148 rolls from Cornerbrook; C. Steiner, 56 cs. from Rotterdam; J. Henschel & Co., 3 cs. from Hamburg; M. Gottesman & Co., 656 reels from Gothenburg; Guaranty Trust Co., 201 bls. from Hamburg; Walker Goulard Plehn Co., 65 cs. from Bremen and 3 bls. Trieste; The Times Co., 111 reels from Gothenburg; Order, 37 bls. from Hamburg, 228 reels and 79 cs. Bremen, 22 bls. Oslo, and 709 reels Kotka.

Wrapping—Arkell Safety Bag Co., 599 reels from Gothenburg; C. Steiner, 28 cs. from Hamburg, 8 cs. Rotterdam and 56 bls. Oslo; Birn & Wachenheim, 23 cs. from Antwerp; Philip Maguire & Co., 45 cs. from Antwerp; Robert Hoe & Co., 2 bls. from London; Gilbert Paper Co., 98 bls. from Gothenburg; Pratt Paper Co., 1,413 reels from Gothenburg; J. P. Harris & Co., 4 cs. from San Juan; Empire Trust Co., 548 reels from Hernosand; Lincoln Paper Co., 38 bls. from Gothenburg; C. K. MacAlpine & Co., 122 bls. and 24 cs. and 40 reels from Gothenburg; E. Dietzgen & Co., 233 rolls from Gothenburg; K. H. Schmidt, 108 rolls from Hamburg; Manufacturers Trust Co., 15 cs. from Hamburg; Eshbee Corp., 36 cs. from Antwerp; F. C. Strype, 7 cs. from Antwerp; Consumers Paper Co., 10 bls. from Rotterdam; National City Bank, 202 bls. from Antwerp; Union Paper & Twine Co., 178 reels and 45 bls. from Gothenburg; Wilkinson Bros. & Co., 351 reels and 51 bls. and 49 cs. from Gothenburg; C. G. Winans & Co., 573 reels and 26 bls. from Gothenburg; Robert Wilson Paper Corp., 67 cs. from Glasgow; Insight Paper Co., 327 reels from Oslo; Order, 400 bls. and 15 cs. and 4 rolls from Antwerp and 4 bls. from Glasgow.

Cigarette—Standard Products Corp., 383 cs. from Havre; P. J. Schweitzer, Inc., 105 cs. from Marseilles and 9 cs. Havre; Werrgen Charte Corp., 6 cs. from Kobe; Surbrug Co., 15 cs. from Havre; DeManduit Paper Corp., 379 cs. from Havre and 718 cs. St. Nazaire; R. J. Reynolds Tobacco Co., 200 cs. from Havre and 1135 cs. St Nazaire; British-American Tobacco Co., 61 cs. from Liverpool; American Tobacco Co., 1,100 cs. from Bordeaux; Southern Pacific Co., 3 cs. from Havre.

Writing—Distinctive Writing Paper Co., 8 cs. from Havre; F. L. Kraemer & Co., 3 cs. from Southampton and 2 cs. London; American Express Co., 5 cs. from Havre; R. F. Downing & Co., 5 cs. from Hamburg; C. Steiner, 11 cs. from Hamburg; Winsor & Newton, 2 cs. from Southampton; Guibont Freres & Co., 9 cs. from Havre.

Filter—E. Fougera & Co., 85 cs. from Bordeaux; H. Reeve Angel & Co., 15 cs. from London; C. Sleicher & Schull Co., 9 cs. from Hamburg; J. Manheimer, 160 bls. from Southampton; A. Giese & Son, 53 bls. from Southampton.

Drawing—H. Reeve Angel & Co., 11 cs. from Southampton and 4 cs. London; Keuffel & Esser Co., 159 cs. and 76 rolls from Hamburg; Favor, Ruhl & Co., 4 cs. from London.

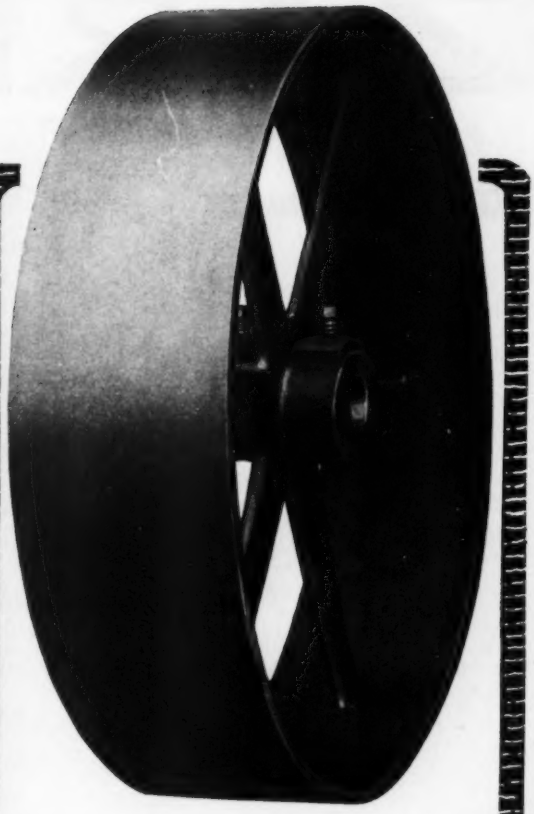
Tissue—B. F. Drakenfeld & Co., 3 cs. from Liverpool; F. B. Vandegrift & Co., 3 cs. from Liverpool; M. Spiegel & Sons, 9 cs. from Hamburg; Order, 5 cs. from Hamburg.

Hanging—F. J. Emmerich & Co., 12 bls. from Southampton, 26 bls. and 58 pkgs. Liverpool, 14 bls. London and 23 pkgs. Hamburg; C. A. Haynes & Co., 75 pkgs. from London and 33 bls. Liverpool; A. C. Dodman, Jr., Inc., 126 bls. from Southampton and 203 bls. Liverpool; W. H. S. Lloyd & Co., 2 cs. from Havre and 5 bls. Liverpool; F. Blank & Co., 25 cs. from Hamburg; G. J. Hunken & Co., 2 cs. from Hamburg; Globe Shipping Co., 5 bls. from Hamburg; R. F. Downing & Co., 49 pkgs. from London; J. E. Bernard & Co., 37 pkgs. from Antwerp; Meadows, Wye & Co., 3 cs. from London.

Photo—P. C. Zuhlke, 141 cs. from Antwerp; American Express Co., 60 cs. from Antwerp; Medo Photo Supply Co., 5 cs. from London; J. H. Schroeder Banking Corp., 22 cs. from Bremen; Gevaert Company of America, 85 cs. from Antwerp; J. J. Gavin & Co., 6 cs. from Liverpool; Globe Shipping Co., 63 cs. from Bremen.

Board—J. P. Heffernan Paper Co., 480 reels from Rotterdam; Adrian Vuyck, 2,277 reels from Rotterdam; Coty, Inc., 186 cs. from Havre; J. A. Raber, 5 bls. from Gothenburg; O. M. Baxter, Inc., 24 cs. from Gothenburg; Perkins-Goodwin Co., 506 reels from Rotterdam; Robert Wilson Paper Corp., 391 reels from Antwerp and 93 reels Rotterdam; Brooks Paper Co., 10 cs. from Liverpool; Haas Bros., 100 reels from Rotterdam; State Bank, 126 rolls from Rotterdam; J. E. Bernard & Co., 23 cs. from Rotterdam; Bank of the United States, 290 reels from Hamburg; Lagerloef Trading Co., 287 bls. from Bremen; Order, 32 bls. from Hamburg.

Miscellaneous—Bendix Paper Co., 20 cs. from Hamburg; H. D. Catty & Co., 3 cs. from Antwerp; Heemsoth, Basse & Co., 5 cs. from Antwerp and 4 cs. Hamburg; J. E. Bernard & Co., 14 cs. from Antwerp and 6 cs. Gothenburg; Japan Paper Co., 4 cs. from Genoa, 35 cs. Havre, 5 bls. Marseilles and 8 cs. London; Whiting-Patterson Co., 32 cs. from Southampton; D. C. Andrews & Co., 6 cs. from Havre, 42 cs. Hamburg and 2 cs. Southampton; Causon & Montgolfer, 14 cs. from Havre; Stern Bros., 11 cs. from Havre and 2 cs. Southampton; S. A. Citroen, 4 cs. from Havre; Keller-Dorian



Drive Right!

Don't make your belts take all the shocks unaided.

Use CAST IRON PULLEYS of proper design and correct weight to help. They are the only kind having the stamina, and the ability to store up sufficient energy, to drive right through heavy starting and peak loads without a tremor. And what is more important, you will no longer be troubled with breaking belts.

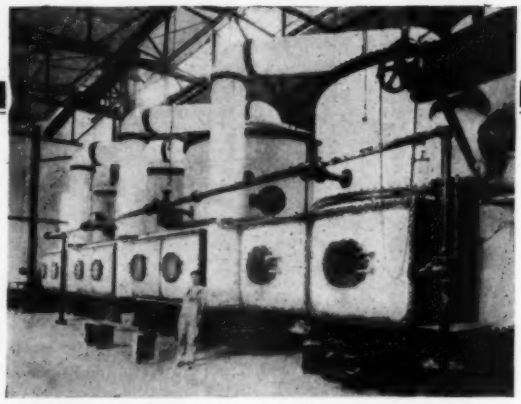
THE T. B. WOOD SONS CO. LINE

is made of Cast Iron, which is strong, rigid and of permanent structure. The line includes Pulleys, Hangers, Couplings, Flexible Couplings, Conveyors, Friction Clutches, Pillow Blocks, the U. G. Automatic Belt Contactor and Ball Bearing equipped units.

Send for catalog 70.

T. B. Wood's Sons Co.
Chambersburg, Pa.
POWER-TRANSMISSION MACHINERY AND SPECIAL MACHINERY

ZAREMBA



The largest quadruple effect evaporator for handling neutral sulphite waste liquor—

That is . . . . to our knowledge. Installed in 1917 it has given satisfactory service and caused no worry to its owner. Our apparatus can be installed with any designed margin of increased capacity—not only that, but the policy of Zaremba Engineers—to design each installation to meet specific conditions—has been responsible for its success.

ZAREMBA COMPANY
168 Franklin St., Buffalo, U. S. A.

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"Tannite" Deckle Straps—

An Improved, Precision-Made Article
They Lie Flat—And Run Straight
Even At High Speed

Mfg. By
STOWE & WOODWARD COMPANY
Newton Upper Falls, Mass.

THE WATERBURY FELT CO.

SKANEATELES FALLS
New York

FELTS and JACKETS

Top and Bottom Wet Felts for board machines, with all the qualities requisite to insure long life and continuous production.

They Satisfy

Paper Co., 50 cs. from Havre; R. F. Downing & Co., 3 cs. from Havre; J. D. Richardson Co., 30 cs. from Rotterdam; Walker Goulard Plehn Co., 13 bls. from Hamburg; International Forwarding Co., 16 cs. from Hamburg and 12 cs. Rotterdam; Manufacturers Trust Co., 27 cs. from Hamburg; Mitsui & Co., Ltd., 24 reels from Yokohama; F. L. Kraemer & Co., 15 cs. from Bremen; F. C. Strype, 74 cs. from Hamburg; Breher & Bernitz, 11 cs. from Hamburg; P. H. Petry & Co., 6 cs. from Rotterdam, 6 cs. Hamburg and 8 cs. Havre; Beekman Card & Paper Co., 10 cs. from Rotterdam and 16 cs. Bremen; Dingelstedt & Co., 14 cs. from Rotterdam and 8 cs. Bremen; J. P. Heffernan Paper Co., 6 bls. from Rotterdam; Hensel, Bruckman & Lorbacher, 2 cs. from Rotterdam, 44 cs. Bremen and 14 cs. Havre; F. Murray Hill, Inc., 8 cs. from Bremen; W. J. Byrnes & Co., 6 cs. from Hamburg; Atlantic Forwarding Co., 10 cs. from Hamburg; Charles W. Williams & Co., 15 cs. from Antwerp; Borden & Riley Paper Co., 7 cs. from Antwerp; C. A. Johnson & Co., 12 bls. from Liverpool; S. Gilbert, 33 cs. from Bremen; Cohen & Mann, 4 cs. from Bremen; Arles & Co., 6 cs. from Havre; G. W. Sheldon & Co., 2 cs. from London and 2 cs. Southampton; Brown Bros. & Co., 6 cs. from Hamburg; Coenca-Morrison Co., 2 cs. from Havre; C. H. Boulin, 27 cs. from Havre; Richard Shipping Corp., 4 cs. from Bremen; Dunlap & Co., 22 cs. from Havre; C. Clark, 8 cs. from Havre; Steiner Paper Corp., 26 cs. from Rotterdam; F. Henjes, Jr., Inc., 5 cs. from Rotterdam; Sanka Coffee Co., 13 bls. from Bremen; F. Schumann Co., 15 bls. and 21 rolls from Rotterdam; Guaranty Trust Co., 67 cs. from Hamburg; American Exchange Irving Trust Co., 29 cs. from Hamburg; Schenkers, Inc., 76 cs. from Hamburg; B. Altman & Co., 3 cs. from Rotterdam; New York Blue Print Paper Co., 3 cs. from Rotterdam; J. J. Shore & Co., 59 reels from Rotterdam; E. M. Sergeant Co., 4 cs. from Gothenburg; Kolesch Co., 7 cs. from Rotterdam; Meadows, Wye & Co., 19 cs. from Rotterdam; Richardson Bros., 4 cs. from Liverpool; A. Price & Son, 35 bls. from Rotterdam; Louis Dejonge Co., 32 cs. from Rotterdam; Globe Shipping Co., 3 cs. from Rotterdam and 161 cs. Bremen; J. Beckard & Co., 11 cs. from Bremen.

Market Quotations

(*Continued from page 1597*)

	Bid	Asked
Eddy Paper Co. 7½s, 1931	103½	
Escanaba Paper 6s, 1939	94	
Escanaba Paper 5s, 1928	99	100
Filer Fibre 7s	92	94
Fort William Paper Co. 6s, 1946	99½	
Frazier Co., 6s, 1950	100	101
*Gair (Robt.) 5½s, 1942	97	
Gilbert Paper Co. 6½s	90	
Howard Smith Paper 6s, 1934	101½	
Hartje Paper Co. 6s	1½	
Hammermill Paper Co. 6s, 1939	100	102
Hoberg Paper & Fibre Co. 7s, 1937	94	96
Industrial Fibre 8s	96	
International Paper 6s, 1941	115	
Itasca Paper Co. 6s	97	
Itasca Paper & Prairie River 5½s	96	
Kalamazoo Vegetable Parchment 6s, 1938	99	
Kieckhefer Container 5½s, Serial		99½
Lake Superior Pulp & Paper 6s, 1941	Mkt.	
Lake St. John Power & Paper 6½s, 1942	95	98
Marathon Paper Mills 5½s, 1942	100¼	
Manitoba Paper 6½s	100	
Minnesota & Ontario Paper Co. 6s, 1931-50	Mkt.	
Missisquoi Pulp & Paper 7s, 1929	98¾	
Marinette & Menominee Paper 7½s, 1936	103	104½
Mead Pulp & Paper Co. 5s	93	96
Menasha Printing & Carton 6½s, 1939	100	
Mengal Co. 7s, 1934	103	
Michoacan Pulp & Paper 6s, 1945	95	
Michoacan Pulp & Paper 7s, 1929	100	
Monroe Paper Products 7½s, 1932	97	
Munising Paper Co. 6s	96½	100
Nekoosa Edwards 6s	96½	100
Ontario Pulp & Paper Co. 6s, 1931	108	
Ontario Pulp & Paper Co. 6s, 1943	Mkt.	
Orono Pulp & Paper 6s	98	
Oswego Falls Paper 6s, 1941	99	102
Oswegatchie Paper Co. 6s		BW
Oxford Paper Co. 6s	102	104
Oxford Miami Paper Co. 6s	102	104
Paterson Parchment Paper 6s, 1938	101½	102½
Parker Young Co. 6½s, 1944	98	
Port Alfred Pulp & Paper 6½s, 1943	Mkt.	
Price Bros. 6s, 1943	105¾	106½
Paper & Textile Machinery Co. 7s	100½	
Penobscot Chemical Fibre Co. 6s, 1942	102½	
Provincial Paper Co. 6s, 1941	102	
Price Bros. 6s, 1932	105	
Peerless Paper Co. 6s	98	
Queen City Paper Co. 7s, 1933	97½	100
Richardson Co. 6s, 1938	100	
River Raisin Paper Co. 6s, 1936	98¾	
Roland Paper Co. 6s, 1937	99	
St. Anne Paper Co. 6½s, 1946	101	
St. Regis Paper Co. 6½s, 1946	100½	
St. Regis Paper Co. 6s, 1931	100½	
St. Lawrence Paper Co. 6s, 1946	99½	101
Smith (Howard) Paper Co. 6s, 1934	101½	
Spanish River Pulp & Paper 8s, 1941	106½	107½
Spanish River Pulp & Paper 6s, 1931	102	
Stevens & Thompson Paper 6s, 1942	93	94
St. Croix Paper 6½s, 1938	95	97
Taggart Bros. 6s, 1944	95	100
Tait Paper & Color Industries 6s	90	92
Ticonderoga Pulp & Paper 6s, 1940	99	
Tomahawk Craft Paper 7s, 1928	95	98
Tonawanda Paper Co. 5½s	100½	
United Wall Paper 6s, 1947	97	99

Successful on All Kinds of Stock in All Kinds of Mills

The adaptability of Dayton High Speed Beaters to all sorts of conditions, in all sorts of mills, making all sorts of paper, is well established.

In nearly 70 mills now using Daytons are to be found practically all the beating problems likely to arise in paper making. We give below a list of the grades of paper being produced in mills where Daytons do the beating.

Rag Bonds
Book-writing
Container Board
Book-mimeo
Book-cover-writing
Bristol—RR Board
Straw Chip Board
Asbestos
Book-Magazine
Book-bristols
Cont. Bd-Kraft
Tissue
Kraft
Sulphite Bonds
Book
Book-tablet
Cement-flour
W. L. Parchment
Straw
Bonds-Ledgers
Covers-writing
Jute specialties
Specialties
Wall board
Rope
Comb. Board-Chip

Your mill is no doubt producing a product like, or similar to, some item on that list. If so, Dayton High Speed Beaters should be seriously considered. It pays to investigate. Have us send you a list of the mills so you can do that very thing. Write us.

The Dayton Beater & Hoist Co.

Dayton, Ohio

E. K. Mansfield Co., 501 5th Ave., New York, N. Y.

DAYTON
High Speed Beaters

Morey Paper Mill Supply Co.

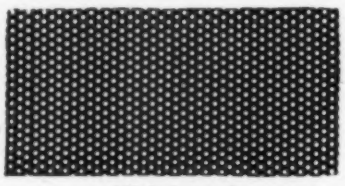
Vulcan TRADE MARK

99 CHAUNCY ST. BOSTON, MASS.

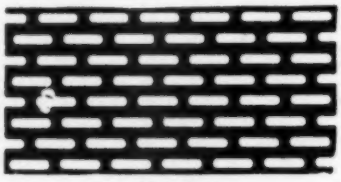
Sole Selling Agents

"LAMBETH" COTTON TRANSMISSION ROPE
and EGYPTIAN COTTON ROPE FOR SHEAHAN CARRIERS
Careful, Intelligent, Quick Service

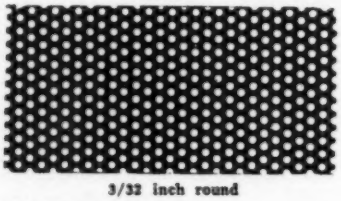
Perforated Metal Screens for Pulp and Paper Mills



.065 inch round



⅛ x ⅝ inch Slots



3/32 inch round

Steel, Copper, Brass, Bronze and other alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.

CHARLES MUNDT & SONS, 57-65 Fairmount Ave., Jersey City, N. J.

UNION SCREEN PLATE CO.

Fitchburg, Mass., U. S. A. Lennoxville, P. Q., Canada

Union Bronze Screen Plates

(Best phosphorised Cast Metal)

Old Plates RECLOSED and RECUT to accurate gauge
UNION BRONZE SCREWS for Screen Plates
Immediate Delivery of the Largest Orders. Satisfaction Guaranteed

The Witham Screen Plate Fastener, Patented

THE ORIGINAL THE BEST

HARDY BRONZE

SCREEN PLATES
ACID RESISTING
VALVES

Wm. A. Hardy & Sons Co.
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SCRANTON

Centrifugal

Steam Triplex Plunger
Vacuum Pumps Jet Condensers

Manufactured by
The Scranton Pump Co., Scranton, Pa.

PUMPS

SCREEN PLATES *and* DANDY ROLLS

Watermarking a Specialty

Central Manufacturing Co.
The Quick Service House
KALAMAZOO MICHIGAN

Whitaker Paper Co. 7s, 1942	107½	108
Wayagamack Pulp & Paper Co. 6s, 1951	103	104
Warren (S. D.) 6s, 1945	102	104
Watab Paper Co. 6½s, 1942	103	
Western Quebec Paper 6½s, 1948		75
Whitman Parsons Pulp & Lumber Co. 8s, Units	20	30
Westfield River Paper Co.. 7s	90	93
STOCKS		
Advance Bag & Paper Co. Pfd	98	
Albany Perforated Wrapping Paper Common	23¾	25
American Writing Paper Co. Ctfs	19	20
American Writing Paper Co. Pfd	48	50
Atlas Plywood Paper Co	60⅝	
American Book Co. Common	152	160
American Sales Book Co. Common	67	69
American Sales Book Co. Preferred	104	105
Abitibi Power & Paper Co. Common	139	140
American Tissue Mills Pfd	90	92
Androscoggin Pulp Co. Common	30	
Androscoggin Pulp Co. Pfd	90	
British Columbia Pulp & Paper Common	4	8
British Columbia Pulp & Paper Pfd	62½	
Brompton Pulp & Paper Common	58	59
Burt (F. M.) Pfd	Mkt.	
Burt (F. M.) Common	69	70
Belgo Canadian Paper Co. Pfd	105	
Beaver Board Co. Pfd	38	39½
Brompton Pulp & Paper Pfd	101½	
Brown Corp.	104	
Canadian Paperboard Co. 7% Pfd	90	
Crown Willamette Paper Co. Pfd	93½	95
Container Corp. Class "A"	14¾	
Canadian Bag Co	180	
Celotex Co. Pfd	88	
Celotex Co. Common	63	
Champion Fibre Co. Pfd	107½	110
Champion Coated Paper Co		125
Champion Coated Paper Co. Pfd	111	115
Champion Fibre Co. Common	250	
Crown Willamette Paper Co. Common		10
Chemical Paper Mfg. Co. Pfd	90	
Chillicothe Paper Co. Pfd		105
De Jonge (Louis) Pfd	95	97
Dryden Paper Co		26
Diem & Wing Pfd	93	97
Dowlington Paper Co. Pfd	101¼	
Donnacona Paper Co. Pfd	103	107
Donnacona Paper Co. Common	85	95
Eastern Mfg. Co	29¾	30¼
Eddy Paper Co		34½
Escanaba Paper Co. Pfd	40	
Frazier Co. Pfd	131	
Fidalgo Pulp Mfg. Co. Common		75
Fidalgo Pulp Mfg. Co. Pfd		105
Great Northern Paper Co	69½	70½
Hawley Paper Co. Pfd	96	
Hammermill Paper Co. Pfd	106	110
Holyoke Card & Paper Co. Pfd	170	
Hinds & Dausch Co. Pfd	101	
International Paper Co. Pfd	109	109¼
International Paper Co. Common	79⅛	80
International Pulp Co. Pfd	60	65
Jessup & Moore Paper Co. 1st Pfd	46½	52½
Jessup & Moore Paper Co. Common	8	12
Laurentide Paper Co	110	113
Mengal Co. Pfd		95
Marathon Mills Co. Common	125	
Mead Pulp & Paper Co. Pfd	104	105
Mead Pulp & Paper Co. Common	62½	
Minnesota & Ontario Paper Co. Pfd	75	80
Munising Paper Co. Pfd	80	90
Munising Paper Co. Common	20	30
Missisquoi Pulp & Paper Co. Pfd	95	100
National Paper & Type Co. Pfd	46	
Oglesby Paper Co. Pfd	101	
Occident Pulp & Paper Pfd		20
Oxford Paper Co. Pfd	107	
Oxford Paper Co. Common	165	
Parker Young Co	75	
Port Alfred Pulp & Paper Co. Common	80	
Port Alfred Pulp & Paper Co. Pfd		102
Penobscot Chemical Fibre Common	75	85
Provincial Paper Co. Pfd	99	101
Price Bros. Common	71	73
Price Bros. Pfd	105	107
Package Paper & Supply Units	22	
Quebec Pulp & Paper Units	78	
Richardson Co. Pfd	105	
Richardson Co. Common	150	
River Raisin Paper Pfd	6¾	9
Robertson Paper Co. Pfd	6	
Sorg (Paul A.) Paper Co. Pfd	100	
Sorg (Paul A.) Paper Co. Common	OW	
St. Regis Paper Co. Pfd	102½	104
St. Regis Paper Co. Common	58¾	
Sefton Mfg. Co. Pfd	97	100
St. Croix Paper Co. Common	150	
Scott Paper Co. Pfd	101½	103
Spanish River Pulp & Paper Pfd	150	
Spanish River Pulp & Paper Common	141	
St. Lawrence Paper Mills 8% Pfd	117	
St. Lawrence Paper Mills Common	101	102
Union Bag & Paper Common	44½	45½
United Paper Board Co. Pfd	63	67
United Paper Board Co. Common	18	20
West Va. Pulp & Paper Co. Common	49	51½
West Va. Pulp & Paper Co. Pfd	101	103
Whitaker Paper Co. Common	61½	64
Whitaker Paper Co. Pfd	103	105
Western Paper Goods "A"	24	30
Watervliet Paper Co	10	
Watson (H. F.) Paper Co	125	
Wayagamack Paper Co	113	116

NORWOOD

Norwood Maintains a Valuable Engineering Service

IN KEEPING with our code of co-operating with paper mill men in every way possible, we maintain an efficient engineering service to help you in the solution of your paper mill problems.

We urge you to make use of this service. If you have a problem in connection with water filtration, or involving calenders, platers, dusters, suction boxes or brushing engines, we suggest that you write us.

We are always glad to discuss your problems, or to send you catalogs, illustrations or specifications.

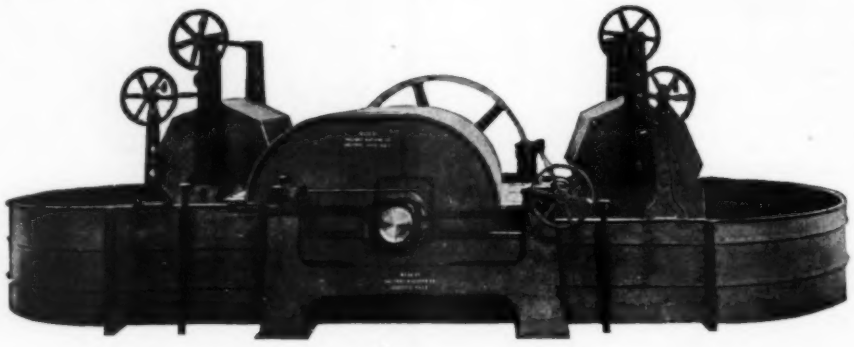
You Can Depend on Norwood Equipment

NORWOOD ENGINEERING COMPANY
Florence, Mass.

NORWOOD

Holyoke Machine Co., Holyoke, Mass.

Makers of Improved Machinery for Wood Pulp and Paper Mills



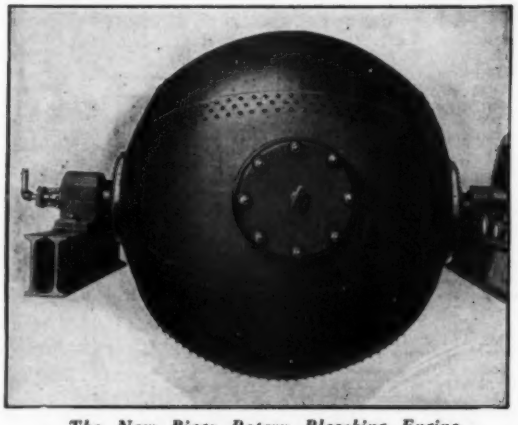
Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels and Governors, Super-Calenders, Platers, Cotton and Paper Rolls.

Pressure Bleaching High Consistency Pulp

The combination of positive agitation and pressure bleaching found only in the Biggs Rotary Cold Bleaching Engine successfully handles pulp up to 25% consistency.

This improved method bleaches a four-ton batch in one hour using only eight horse power. The pressure-globe reduces chlorine consumption materially. All traces of lignin are effectively removed with no perceptible damage to the fibre.

The Biggs Rotary Boiler Book gives full details. Write for your copy today.



The New Biggs Rotary Bleaching Engine (Patents Pending)

THE BIGGS BOILER WORKS COMPANY
General Offices and Works
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Eastern Sales Office: 300 Madison Avenue, New York City.
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